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City of Aurora
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Division of
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FLOODPLAIN MANAGEMENT STUDY

INDIAN CREEK AND TRIBUTARIES

KANE-DUPAGE COUNTIES, ILLINOIS

June 1986

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INTRODUCTION

This report defines the flood characteristics of Indian Creek and its tributaries in the City of Aurora, Kane County and DuPage County. The tributaries studied are Selmarten Creek, Tributary B, and South Tributary. This report defines the flood hazard of existing buildings located along or near these streams. This existing flood hazard is the basis used for the planning of measures to eliminate or reduce flood damages. Appendices E and F provide information on existing building elevations in relation to the floodwater elevation for the 10 percent, 1 percent, and 0.2 percent chance (500 year) recurrent floods for present and future runoff conditions. Appendices E and F have been published under separate cover and copies provided to the local entities involved. This report should stimulate development of flood damage reduction measures and provide data for proper regulation of any new development in the floodplain areas.

Floodprone areas in many locations are a severe problem in Illinois. Watershed urbanization and development within and upstream of the floodplain areas intensify this problem. Currently there are 793 Illinois communities identified as having flood problems. As of March 1, 1985, 735 communities within Illinois are participating in the National Flood Insurance Program (NFIP). The Illinois Department of Transportation, Division of Water Resources (DWR) is the state agency assigned urban flood problems and for setting priorities for flood studies within the urban areas. A joint coordination agreement was executed between DWR and the Soil Conservation Service (SCS) on April 30, 1976 and was revised December 1978 to furnish technical assistance in carrying out these flood hazard studies. These studies are carried out in accordance with Federal Level Recommendation 3 of "A Unified National Program for Floodplain Management," and Section 6 of Public Law 83-566. A Plan of Work was executed by DWR and SCS in October 1983, for the Indian Creek and Tributaries Floodplain Management Study. The cost of this study was shared among DWR, SCS, and the City of Aurora.

The Aurora/North Aurora Flood Hazard Reconnaissance Study published in August 1981 (Reference 1), identified both Indian and Selmarten Creek as floodprone areas. Average annual damages were estimated to be in excess of $88,000 with 55 buildings subject to damage by the 1 percent chance flood. Major floods occurred in December of 1982 and July of 1983 that exceeded the floodprone areas identified in the Reconnaissance Study and the Aurora Flood Insurance Study (FIS) (Reference 2).

Local citizens are concerned that future development in the watershed will aggravate existing problems and increase flood damages. Therefore, they have recommended a no-growth policy for the City of Aurora and Kane County for the area draining into Indian Creek until existing problems have been solved.

The State of Illinois was asked to provide assistance to solve the flood problems associated with Indian Creek. Prior to committing funds for flood control, the State requires completion of a floodplain management study identifying existing hazards and alternative solutions. The State requests the study display the beneficial and adverse impacts of all alternatives considered.

This report is based on the results of a detailed hydrologic and hydraulic analysis of the Indian Creek Watershed and the damage analysis made for the identified floodprone areas. The maps and profiles in this report are adequate for floodplain regulation of the streams studied in detail. The floodway was delineated in accordance with Chapter 19, Illinois Revised Statutes of 1973, 65F (Reference 7).

DESCRIPTION OF STUDY AREA

Indian Creek Watershed is located in Kane and DuPage Counties approximately 30 miles west of the Chicago Loop. Indian Creek is an intermittent stream originating on the National Accelerator Laboratory (Fermi Lab) property east of Batavia, Illinois (See Figure 1). The approximate drainage area of Indian Creek is 14.7 square miles at its confluence with the Fox River in the City of Aurora. The hydrologic sub-watershed number is 07120007-010.

The Indian Creek Floodplain Management Study is concerned with the floodplain along Indian Creek from its junction with the Fox River to upstream of Highway 56 (Butterfield Road), and its tributaries (Selmarten Creek, Tributary B and South Tributary). The channel flows through property owned by U.S. Department of Energy, private concerns, and the City of Aurora.

The primary residential flooding problem area is near the Molitor Road crossing of Indian Creek. Indian Creek and Selmarten Creek junction just upstream of Molitor Road. Major commercial damages occur at the junction of Indian Creek and Fox River and along the South Tributary just east of Farnsworth Avenue.

The area has been undergoing rapid development in the last 10 years and is expecting extensive development in the next 20 years. See Figures 5 and 6 for present (1985) and estimated future (2005) land use in the watershed.

The formation of the soils in this watershed was influenced by the glaciers which covered the area. The topography varies from level and nearly level to rolling with numerous depressions. The parent materials are loess, coarse and medium textured glacial outwash, glacial till, alluvium, and organic deposits. (Reference 12, 13)

Drainage characteristics of the soils vary across the drainage scale; well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. Water is removed readily from well drained soils but is available to plants throughout the growing season. Drainage in well drained soils is not a limiting factor for most non-agricultural uses. At the other end of the drainage scale, water is removed from the soil so slowly that free water remains at or near the surface during most of the year. Artificial drainage is necessary for most crops to be grown. The very poorly drained soils have severe limitations on both agricultural and non-agricultural uses. Poor drainage can result from a high water table, a slowly pervious layer within the profile, seepage or a combination of these.

The well drained soil series are Dresden, Harvard, Markham, Morley, and Zurich. The somewhat poorly drained soils are Beecher, Elburn, Elliott, Millbrook, Mundelein, and Wauconda. The poorly drained soils are Drummer, Harpster, Milford, and Thorp. The very poorly drained soils are Houghton and Peotone.

The climate of the watershed is classified as humid continental which is characterized by warm summers, cold winters and relatively large daily, monthly and yearly variations in both temperature and precipitation. Average annual precipitation is 34.7 inches. March through October precipitation averages 3.4 inches monthly. Mean annual runoff is approximately 9 inches or about 26 percent of total precipitation (Reference 5 and 13).

During January, normally the coldest month, temperatures range from a normal maximum of 30 degrees F to a normal minimum of 12 degrees F. During July, normally the warmest month, temperatures range from a normal maximum of 84 degrees F to a normal minimum of 62 degrees F. The maximum temperature of 90 degrees F is exceeded on 30 days in a normal summer. The average frost-free season is 160 days (Reference 5 and 13).

Based upon the 1980 Census of population, the populations of Kane and DuPage Counties were 278,405 and 658,835 respectively. From the period 1970 to 1980 Kane County registered a 10.9 percent increase in population while DuPage County experienced a 35 percent increase in growth. (Reference 14).

The unemployment rate within the study area has been below state and national averages. According to the Illinois State Employment Security Office, the July 1985 unemployment rate for Kane and DuPage Counties was 7.8 and 5.8 percent respectively versus a 7.3 and 8.9 for the United States and the State of Illinois respectively.

The per capita income for both Counties was higher than the State of Illinois and national averages for April 1983 according to the Bureau of Economic Analysis. DuPage County registered per capita personal income of $16,338, while Kane County was reported to be at $12,688, as compared to $11,687 and $12,401 for the United States and State of Illinois respectively.

The City of Aurora had 23,501 occupied housing units of which 65% were owner occupied according to the 1980 census of housing.

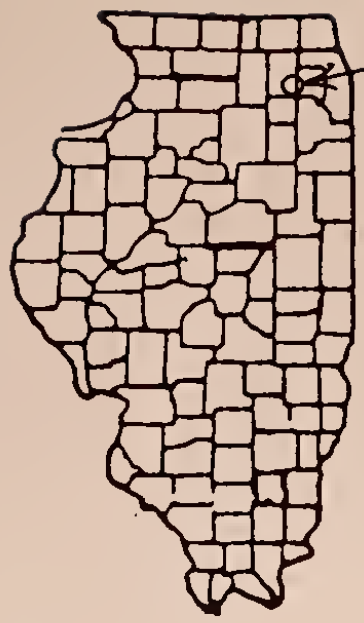

FIGURE 1

VICINITY MAP

Indian Creek and Tribs

Kane and DuPage Counties, Illinois

NATURAL VALUES

The Indian Creek Watershed is located in a rapidly developing area. The new development consists of some commercial but mainly single and multiple family residences. The table which follows illustrates this rapid change:

LAND USE	APPROXIMATE AREA (% OF WATERSHED)		
	1972	1985	2005 (Est.)
Urban	29%	41%	65%
Agricultural	71%	59%	35%

The agricutural land is presently located on the east and north sides of the watershed (See Figure 5). Most of the soils in the watershed are on the State list of prime farmland soils. Houghton Muck and Muskego are classified as important farmland. Currently it is estimated that 225 acres of farmland are in the floodplain identified in the detailed study area of this report. It is expected that the primary area not developed by the year 2005 will be the U.S. Department of Energy's National Accelerator Lab (Fermi Lab) located in the north portion of the watershed (See Figure 6).

The significant wildlife habitat in the Indian Creek Watershed exists primarily within the boundaries of the National Accelerator Laboratory property and in natural wooded areas scattered throughout the watershed. Isolated wetland areas are located along the natural drainage paths. Other areas of significant size occur on South Tributary, Tributary B, and on the upper reaches of Indian Creek.

Primary plant communities in the wooded areas are upland hardwood forest and upland and lowland successional communities. The remaining part of the watershed is either used for row crop production, or is developed urban land. Wildlife habitat quality varies from poor to moderate in the intensively developed areas.

The Indian Creek channel through the National Accelerator Laboratory property is in its natural condition. It is a small intermittent, meandering stream that in places is well shaded. It flows through several wetland areas prior to leaving the property toward the south. The Indian Creek channel in the farmland areas north of the East-West Tollway is a combination of natural channel and modified channel. In some reaches minor straightening and diking has occurred to reduce flooding damages to cropland.

Today only about 6.2% of the original Kane County wetlands remain but they are a significant environmental feature of the topography found in the Indian Creek Watershed (Reference 16). The upstream portion of South Tributary, located in DuPage county, contains a large natural wetland. Inspection of the 1984 topographic maps as well as the soil survey reports indicate several areas that could be classified as wetland. The soils mapped as Milford silty clay loam and Drummer silty clay loam was wetland at one time although some of it now has been drained by surface ditches or underground tile to allow for agricultural or urban uses. Both Milford and Drummer soils are poorly drained and moderately slowly permeable and both have seasonal high water tables that are near the surface or ponded on the surface. These wet soil conditions support wetland vegetation such as elm, ash, cottonwood, cattails, and sedges.

The channels of Indian Creek and most of the tributaries occur almost entirely in the poorly drained Milford silty clay loam or Drummer silty clay loam soils. Surface runoff is very slow and often may be ponded. The potential of Milford or Drummer for urban uses is poor because of the wetness problems. Natural vegetation is bottomland hardwoods, but nearly all of Indian Creek has been encroached upon by development and much of the natural vegetation is gone. The present vegetation is a mixture of native plants such as silver maple, elm, swamp white oak, willow, hawthorn, ash, bur oak, basswood, cottonwood, gray dogwood, American cranberrybush, and nannyberry and introduced landscaping plants such as honeysuckle, siberian elm, buckthorn and other ornamentals.

A rich variety of wildlife species are associated with the plant communities described above. Wetlands in particular provide very important habitat conditions. In a detailed analysis of habitat types and wildlife abundances, Byers et al (Reference 16) developed a Basic Wildlife Index that rated habitat types in Kane County. Wetlands (26.79) scored nearly 60 percent higher than the second best habitat type, Riverine Woodlands (16.50), which scored only slightly higher than undistributed (16.29), unaltered greenbelts (10.44), and hayfields (10.04) while cropland (4.29) scored lowest of the nine habitat types studied. All of these habitat types occur within the watershed of Indian Creek, but altered greenbelts predominate along the channel of Indian Creek. Refer to Byers et al (Reference 16) for a detailed description of wildlife and wildlife habitat in Kane County.

The 1981 List of Endangered and Threatened Species of Illinois (Reference 4) cites 39 plant species known to exist in Kane County that are officially designated as endangered or threatened. That same list cites 2 species of animals that are designated as threatened.

No archaeological sites or historical sites have been identified in the detailed study area.

FLOOD PROBLEMS

The primary damage areas evaluated as part of this study are shown on Figure 2. Four of these six areas suffer significant damages to residences and commercial properties. The following table summarizes the number of buildings flooded by the 100 year, present condition flood, and the calculated average annual damage for each area.

PROPERTIES FLOODED - PRESENT CONDITION

LOCATION	NUMBER OF BUILDINGS	AVERAGE ANNUAL DAMAGES
(1) Eastview Estates	53	86,800
(2) Selmarten Creek	11	15,100
(3) Indian Creek-Upper	71	189,400
(4) Indian Creek-Middle	12	17,000
(5) Indian Creek-Lower	9	101,100
(6) South Tributary	5	186,400
TOTAL	161	$595,800

Areas numbered 5 and 6 are commercial areas while most of the remaining buildings in Areas 1 through 4 are primarily residential and associated structures.

The most recent large flood occurred in July of 1983. This flood resulted from rainfall of approximately 5.4 inches. It is estimated that a rainfall of this magnitude and its resulting flood could be expected to occur approximately every 50 years or have a 2% chance of occuring in any given year.

Area 1, Eastview Estates, is a subdivision located in an area with very poor surface drainage. The center of the subdivision is approximately 3 feet lower than the lowest yard or street around the edge of the subdivision. Therefore, any water that gets into the subdivision ponds until it can drain through the existing 30 inch storm sewer that outlets into Indian Creek. During major floods, the predicted floodwater elevation on Indian Creek is about 3 feet higher than the low point in Eastview Estates.

Currently the natural drainage of approximately 0.9 square miles of land located east-southeast of Eastview Estates is toward the subdivision. Runoff from this land is either carried by the ditch (Tributary B) located along the abandoned railroad track or it ponds in the low areas south of the track and in Eastview Estates. The existing bankfull capacity of Tributary B, even with the latest changes (1984) to the culvert under Farnsworth, is less than 50 cfs. Therefore, all flood water peaks over 50 cfs will result in flooding of Eastview Estates. The low land south of the subdivision presently floods before floodwater enters Eastview Estates.

During the December 1982 and July 1983 floods, this area suffered significant flood damages. Local citizens reported between 50 and 80 homes flooded in the July 1983 storm with damages in excess of $400,000. Additional homes suffered damages from sewer backup associated with flood water entering the sanitary sewer system.

Area 2, along Selmarten Creek, is an area with a mixture of multiple family dwellings, single family residential, and small manufacturing plants. This entire area was surrounded or covered by floodwater during the July 1983 flood. Many automobiles in the parking lots associated with the multiple family dwellings had water inside the cars, damaging seats and carpeting. Very few buildings reported water on first floor. No damage estimate was prepared by local citizens for this area.

Area 3, Upper Indian Creek, is predominantly a single family residential area with some new multiple family dwellings located in the northern portion of the area. It also includes Aurora Manor, a nursing home, located at 1601 N. Farnsworth Avenue and other commercial establishments along Farnsworth. During the 1983 flood all 190 plus residents of the nursing home were evacuated and located in temporary housing for approximately one week. The basement of Aurora Manor was filled with flood water and the water was approximately 3 inches deep on the first floor. The initial estimate of damage, including temporary housing, by Aurora Manor was $125,000. This did not include any structural damage estimate. A total of over 30 homes, with damages in excess of $100,000, were identified by local citizens as flooded in this area by the July 1983 storm.

Area 4, Middle Indian Creek, has very limited flooding problems. Most of the buildings are located above the predicted 100 year flood elevation. The primary damages are to two residences located north of Sheffer Road and the traffic interruption on Farnsworth Avenue. During the July 1983 flood a total of 8 buildings were flooded in this area with estimated damages of less than $15,000 according to local citizens.

Area 5, Lower Indian Creek. has extensive flood problems where Indian Creek flows out onto the Fox River floodplain. Garbe Steel Company is located in this area and suffers yearly damage to parking lots, steel storage areas, and to manufacturing areas. A total of 5 buildings owned by Garbe are subject to damage by flood waters. During the 1983 flood, water was inside four of the buildings with damages estimated to be in excess of $205,000. Additional buildings flooded in 1983 include a lumber yard and a salvage yard. Highway 25 was closed to traffic for more than 24 hours and the railroad spur located west of the Garbe property was washed out in 3 or 4 locations. No residential damages occur in this study reach.

Area 6, South Tributary, is subject to a considerable amount of flood damage because of a restricted channel and relatively large drainage area upstream. The amount of damage will vary depending on how the existing large warehouse buildings located east of Farnsworth Avenue are being used at the time of the flood. J&B Industries purchased this property in the early 1980's and were just establishing their business at the time of the July 1983 flood. They have pictures showing flood water over 3 feet deep in one of the warehouses during the 1983 flood. In December of 1984, over $4,000,000 of materials were being stored, repaired, or manufactured in these buildings. Damages from a flood of the magnitude of the 1983 storm with present use of the buildings would probably exceed $1,000,000.

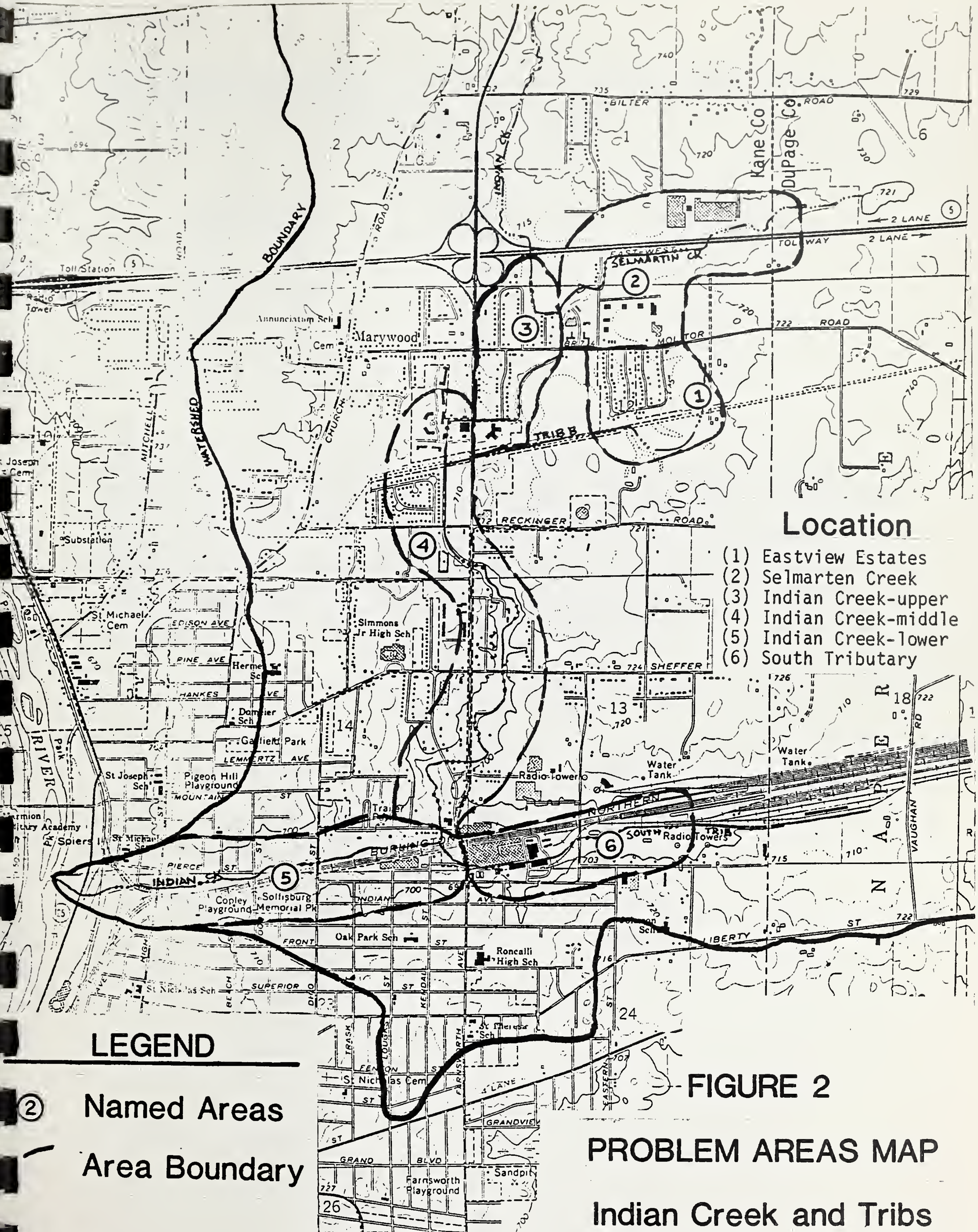

FIGURE 2

PROBLEM AREAS MAP

Indian Creek and Tribs

The following table summarizes by frequency the evaluated urban damages for the Indian Creek Watershed:

TOTAL DAMAGES BY FREQUENCY
Present Without Project

Frequency % Chance	Frequency Year	Total Buildings (Number)	Total Damage (1000 Dollars)
0.2	500	208	7,318.
1.0	100	161	5,509.
2.0	50	152	4,928.
4.0	25	137	3,749.
10.0	10	104	2,174.
20.0	5	81	790.
50.0	2	13	150.

Average Annual Damages = $595,800

The future condition without project evaluation was developed to predict runoff and damage conditions in the year 2005. New development is expected to occur as shown in Figure 6. New development will be required by the City of Aurora and Kane County to protect existing natural storage and to provide on-site detention with a low release rate ie: 0.1 to 0.15 cfs/acre. These requirements were considered when preparing the future condition model. This evaluation shows future average annual damages becoming less than present condition damages because of the on-site detention requirement. See Appendix G for additional information on the modeling procedures.

PROPERTIES FLOODED
Future Condition - without Project
100 Year Flood

Location	Number of Buildings	Average Annual Damages
(1) East View Estates	53	87,400
(2) Selmarten Creek	10	5,700
(3) Indian Creek-Upper	69	97,800
(4) Indian Creek-Middle	10	9,000
(5) Indian Creek-Lower	9	72,400
(6) South Tributary	5	253,600
TOTAL	156	525,900

TOTAL DAMAGES BY FREQUENCY
Future - Without Project

Frequency % Chance	Frequency Year	Total Buildings (Number)	Total Damage (1000 Dollars)
0.2	500	199	6,876
1.0	100	156	5,380
2.0	50	143	4,860
4.0	25	114	4,005
10.0	10	90	1,883
20.0	5	58	591
50.0	2	6	40

Average Annual Damages = $525,900

The major transportation routes effected by flood water are Highway 25 - (Broadway) and Farnsworth Avenue. In addition, many residential streets are covered by flood water during the larger storm events. Estimated annual traffic damages are $2,250.

During the July 1983 flood, Highway 25 was closed for more than 24 hours while flood water was running over the highway. Farnsworth Avenue was closed for more than 18 hours in 1983 and has been closed for several hours during many storm events over the past two years.

EXISTING FLOODPLAIN MANAGEMENT

Currently, the City of Aurora, unincorporated Kane County and unincorporated DuPage County are participating in the Regular Phase of the National Flood Insurance Program (NFIP). This program provides data to the local government so that they can adopt floodplain management measures. Each flood insurance study includes a flood boundary map with a floodway designated to assist the community in enforcing the rules it will use to regulate land use. There are existing flood boundary maps and profiles available for most of Indian Creek and a portion of Selmarten Creek. These maps and profiles are being used by Aurora and Kane County to regulate new construction in the areas subject to flooding.

These existing flood boundary maps do not cover all areas flooded during the July 1983 flood (estimated to be a 2% chance flood) and therefore, not all areas subject to flooding by the 1 percent chance flood have been regulated in the past.

Since the July 1983 flood, the existing hazard to many of the unmapped areas have been recognized by local governments. They have assisted in the evaluation of the flooding problem throughout this study and recognize that the maps included in this report will be used by the Federal Emergency Management Agency (FEMA) to update the flood insurance maps for the communities involved in accordance with guidance from Congress. This report includes both the 100 year (1% chance) floodplain and the 500 year (0.2% chance) floodplain.

In order to provide a national standard without discrimination, the 100 year flood (1% chance) has been adopted by State and Federal agencies as the base flood for purposes of floodplain management measures. The 500 year (0.2% chance) flood is employed to indicate areas of additional flood risk within a community. For all the streams studied in detail, the boundaries of the 100 year and 500 year flood for present runoff conditions have been delineated. These flood boundaries have been determined by using the flood elevations calculated for each valley cross section. Between the surveyed cross sections, the floodplain boundaries were interpolated using topographic maps prepared at a scale 1 inch - 100 feet (contour interval of 1 foot). In cases where the 100 year and 500 year flood boundaries are close together, only the 100 year boundary has been shown. The boundaries of the floodplains are shown on the floodplain maps.

Small areas within the flood boundaries may lie above the flood elevations and therefore not be subject to flooding. However, due to the limiting scale of the topographic maps used to prepare the floodplain maps, such areas are not shown. The profile sheets in Appendix A should be used to ascertain flood elevations for any specific point along Indian Creek and Tributaries for present or future runoff conditions. In addition, Appendix F lists the 10 year, 100 year and 500 year flood elevations for all buildings surveyed in the floodplain. Encroachment on floodplains, such as artificial barriers, reduces the water carrying capacity and increases flood heights thus increasing flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from the floodplain development against the resulting increased flood hazard.

For purposes of the NFIP, the concept of a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the 100 year floodplain is divided into floodway and a floodway fringe. The floodway is the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood discharge can be carried without a substantial increase in flood heights. In this case, blockage of the adjacent floodplain areas without blocking the channel will result in increasing the flood elevations. The floodway fringe area ie: all the floodplain except floodway, is not required to convey the flows but does act as a storage area on flat streams (See Figure 3 for sketch).

In Illinois, the minimum standard used to define the 100 year floodway is described in the Illinois Revised Statutes of 1973 under 65F, Chapter 19 (Reference 7). In this standard, the encroachment in the floodplain is limited to that which will cause only an insignificant increase in flood heights. The Illinois Division of Water Resources has recommended that the floodway be determined using no more than a 0.1 foot surcharge (Reference 3). The 0.1 foot surcharge floodway proposed for this study was computed by equal conveyance reduction from each side of the floodplain.

As shown on the flood boundary and floodway maps, the floodway boundaries were determined at individual cross sections. Between the cross sections the boundaries are interpolated.

The area between the floodway and boundary of the 100 year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevations of the 100 year flood more than 0.1 of a foot at any point. The typical relationship between the floodway fringe and the floodway are shown in the floodway schematic (Figure 3).

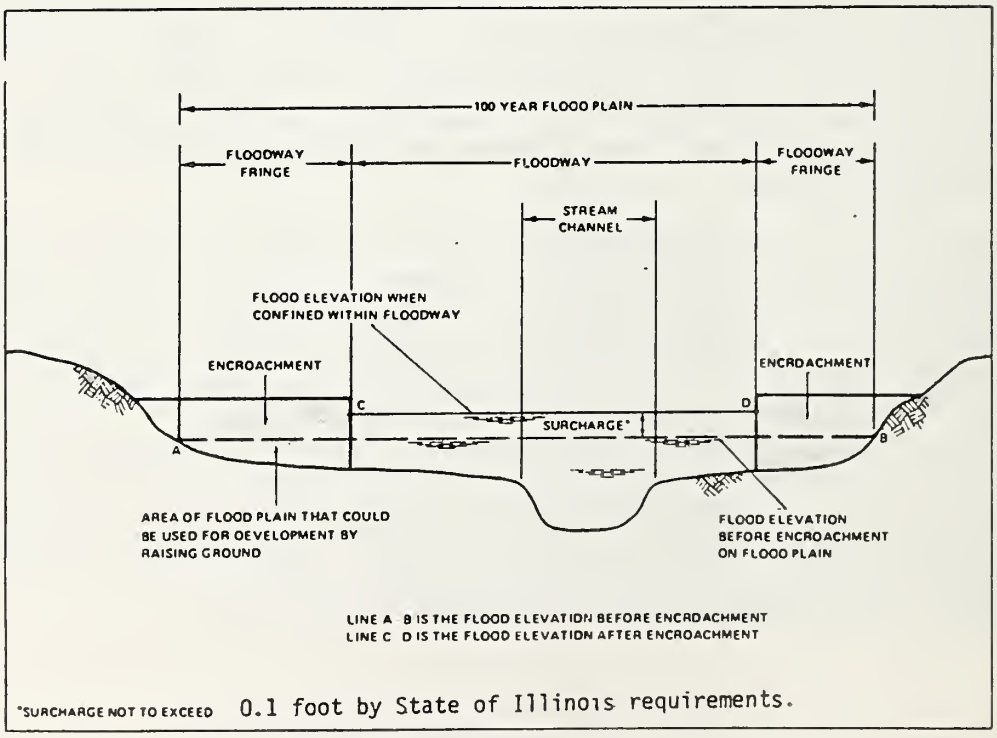

FIGURE 3

FLOODWAY SCHEMATIC

STRUCTURAL MEASURES EVALUATED

The following describes the different structural measures evaluated as part of the study. Since the damage areas are widely scattered it was readily apparent that no one structural measure could solve all of the problems. Therefore, many different structures were evaluated and their impacts determined. The following discussion describes each of these structural measures. See Appendix C for sketches of each measure, Appendix D for detailed information on costs, Appendix G for combinations of structures evaluated and Figure 4 for the location of these measures.

Reservoir 13 -

Components: The excavation of 332,100 cubic yards of material from the 100 year floodplain of Indian Creek upstream of the East-West Tollway (Illinois 5). This excavation would be located along the east side of the existing channel with a bypass structure sized such that all flows larger than 225 cfs would enter the excavated reservoir through a reinforced concrete structure. The excavated reservoir would empty back into Indian Creek near the East-West Tollway through two 48 inch diameter reinforced concrete pipes.

Costs: The total cost of this measure is $2,617,000 with average annual costs estimated to be $230,500 which includes OM&R of $4,700.

Effects: This reservoir will provide temporary storage for 337 acre feet of runoff below elevation 718.5. The 100 year peak discharge at the East-West Tollway for future runoff conditions will be reduced from 944 to 526 cfs. A total area of 56 acres of grassland and woodland will be dedicated to reservoir storage usage. Average annual damages in the Upper Indian and Selmarten Creek damage areas will be reduced by $70,000.

The Benefit/Cost Ratio for this element is 0.30:1.

Reservoir 14 -

Components: The excavation of 100,000 cubic yards from the 100 year floodplain of Selmarten Creek upstream of the East-West Tollway. This excavation would be located east and north of the existing grove of trees located just east of the Sealmaster Corp. property line. The existing culvert under the East-West Tollway will be the control structure for this reservoir. Water will flow directly into the site over a rock chute structure at the location of the existing stream channel.

Costs: The total cost of this measure is $807,300 with average annual costs estimated to be $70,800 which includes $1,200 OM&R.

Effects: The reservoir along with natural storage will provide 104 acre feet of flood storage below elevation 717.8. The 100 year peak discharge at the East-West Tollway for present runoff conditions will be reduced from 589 cfs to 330 cfs. An area of 15 acres of farmland will be dedicated to reservoir storage usage. An additional 4 acres of bottomland woods will remain in floodplain usage. Average annual damages in the Selmarten and Upper Indian Creek damage areas will be reduced $20,000.

The estimated Benefit/Cost Ratio = 0.28:1.

Reservoir 15 -
Components: The excavation of 431,300 cubic yards of material from the 100 year floodplain of Indian Creek upstream of the East-West Tollway. This is the same location as Reservoir 13 except the bottom of the reservoir is lowered 2 to 3 feet. The bypass rate is still 225 cfs. The reservoir will be drained through two 48 inch diameter RCP to Indian Creek at the East-West Tollway.

Costs: The total cost of this measure is $3,009,700 with average annual costs estimated to be $265,100 which includes OM&R of $5,500.

Effects: This reservoir will provide temporary storage for 381 acre feet of runoff below elevation 718.2. The 100 year peak discharge at the East-West Tollway will be reduced from 944 to 408 cfs. Approximately 56 acres of grassland and woodland will be converted to reservoir storage usage. Average annual damages in the Upper Indian, Middle Indian and Selmarten Creek damage areas will be reduced by $80,000.

The estimated Benefit/Cost Ratio = 0.30:1.

Reservoir 16 -
Components: The excavation of 510,000 cubic yards of material from the 100 year floodplain of Indian Creek and existing grassland located upstream of the Prairie Path on the Fermi Lab property. The excavation will be limited to the land located west of Indian Creek. The existing bridge at the Prairie Path will be the control structure. The bottom of the excavation will be at 729.0 which is 1.5 feet above the channel bottom at the Prairie Path bridge.

Cost: The total cost of this measure is $2,284,400 with average annual costs estimated to be $202,200 which includes OM&R of $5,100.

Effects: The reservoir in combination with existing natural storage will provide 225 acre feet of flood storage below elevation 733.0. The 100 year peak discharge will be reduced from 650 to 395 cfs. An area of 80 acres, 50 acres currently in grassland and 30 acres in natural wetlands (wooded swamp), will be converted to reservoir storage usage. Most of the existing wetland will be preserved by limiting construction to the land located west of the existing channel. The wetland is dominated with elm, ash, silver maple, willow, cottonwood, swamp white oak, gray dogwood, silky dogwood and viburnum. It provides excellent wildlife habitat for important species such as white-tailed deer, mallard ducks and great blue herons as well as other species. Average annual damages in the Upper Indian and Selmartin Creek damage reaches will be reduced by $70,000.

The Benefit/Cost Ratio for this measure is 0.35:1.

Reservoirs 41 and 84 were evaluated together because neither site by itself could significantly reduce flood damages in Eastview Estates.

Reservoir 41 -
Components: The excavation of 37,000 cubic yards of material from the existing 100 year floodplain and existing farmland located to the east of Eastview Estates and north of the power line corridor. The excavation will be between Eastview Estates and the existing farm buildings. Flood water will outlet

FIGURE 4

STRUCTURE LOCATIONS

Indian Creek and Tribs

Kane and DuPage Counties, Illinois

through a 24 inch diameter CMP into an enlarged channel along the power line corridor to Felton Road. Bottom of excavated reservoir to be elevation 713.0.

Costs: The total cost of this measure is $236,600 with estimated average annual costs of $20,800 including $400 OM&R.

Effects: This reservoir in combination with existing natural storage and reservoir 84 will effectively prevent most of the flood damages associated with overland flow in Eastview Estates. This reservoir stores the runoff from the east that presently flows overland into Eastview Estates. The effective 100 year flood storage is 27 acre feet at elevation 716.0 and the 100 year peak discharge is reduced from 130 to 39 cfs. An area of 11 acres currently used as farmland will be converted to reservoir storage usage.

Reservoir 84 -
Components: The excavation of 92,000 cubic yards of material from the 100 year floodplain of Tributary B, east of Felton Road and south of the power line corridor. A new 38"x60" CMP would be installed to empty the reservoir into the existing ditch (Tributary B) along the power line corridor just west of Felton Road. The bottom of the reservoir would be at elevation 711.0.

Costs: The total cost of this measure is $671,500 with the estimated average annual cost of $59,000 which includes OM&R of $1,100.

Effects: This reservoir in combination with existing natural storage and reservoir 41 will effectively prevent most of the flood damages that are associated with overland flow entering Eastview Estates. This reservoir will store 46 acre feet of the flood water that presently flows toward Eastview Estates from the southeast. The 100 year peak discharge crossing Felton Road will be reduced from 304 to 49 cfs. An area of 14 acres partly in cottonwood and willows and about two-thirds in farmland, will be converted to reservoir storage usage.

The damage reduction to Eastview Estates with the installation of both reservoir 41 and 84 is $77,000 annually.

The Benefit/Cost Ratio of these reservoirs is 0.96:1.

Reservoir 85 -
Components: This is the on-site detention area shown in the preliminary plans for Huntington Chase Development Co. Inc. The site is located west of Felton Road and South of the Power line corridor. As evaluated in this study the reservoir will store 13 acre feet of flood water above the permanent pool and outlet into Tributary B through a 48 inch diameter reinforced concrete pipe. Existing natural storage in this area below elevation 715.0 is 11+ acre feet.

Costs: No cost estimate was made as this will be part of the new development.

Effects: This reservoir in conjunction with reservoir 41 and 84 or reservoir 86 and 87 will provide protection of Eastview Estates from overland flooding. The primary impacts of Reservoir 85 is to protect from increased damages due to urban development west of Felton Road. The total land area of the reservoir is 4.5 acres.

Reservoirs 86 and 87 were evaluated together because neither site by itself could significantly reduce flood damages in Eastview Estates.

Reservoir 86 -
Components: The excavation of 59,600 cubic yards of material from the existing 100 year floodplain located to the east of Eastview Estates. This reservoir is an enlarged reservoir 41. The flood water from the reservoir will outlet through a 24 inch CMP into an enlarged channel along the power line corridor to Felton Road. Bottom of the excavated reservoir will be 713.0.

Costs: The total cost of this measure is $356,600 with its annual cost estimated to be $31,500 including $700 OM&R.

Effects: This reservoir in combination with the existing natural storage and reservoir 87 will effectively prevent all flood damage in Eastview Estates up to the 100 year event. This reservoir will store 32 acre feet of water at elevation 715.5 during the 100 year flood. The 100 year peak discharge continuing toward Eastview Estates will be reduced from 130 to 12 cfs. A land area of 15 acres of farmland will be converted to reservoir storage usage.

Reservoir 87 -
Components: The excavation of 137,000 cubic yards of material from the existing 100 year floodplain of Tributary B east of Felton Road at the same location as reservoir 84. This is an enlarged reservoir 84 which will outlet into Tributary B west of Felton Road through a 38"x60" CMP.

Costs: The estimated total cost of this measure is $937,900. On an annual basis, the cost is estimated to be $82,500 which includes $1,600 for OM&R.

Effects: This reservoir will store 56 acre feet at elevation 714.3 during the 100 year storm. The 100 year discharge is reduced from 304 to 33 cfs. The total land area required for reservoir storage is 19 acres. Presently this land is in woodland or farmland.

This reservoir in combination with existing natural storage and reservoir 86 will reduce the annual damages to Eastview Estates from $87,400 to $4,600 for a benefit of $82,800.

The Benefit/Cost Ratio of the combination of reservoir 86 and 87 is 0.73:1.

McClure Reservoir -
Components: This consists of the excavation of a reservoir east of McClure Road and south of the Burlington Northern Railroad on South Tributary. The reservoir was evaluated using three different bypass rates and using a pumping plant to evacuate the water stored in the excavated reservior.

The following table summarizes the components of each evaluation.

		A	B	C
	Bypass Rate	125 cfs	150 cfs	200 cfs
	Excavation	461,000 CuYd	421,000 CuYd	342,000 CuYd
	Storage Volume	275 AcFt	250 AcFt	200 AcFt
	Land Area	15.2 Ac	15.2 Ac	12.7 Ac
	Elev. Pit Btm.	665.0	670.0	670.0
	Bypass Pipes	2 ea 36in.RCP	1 ea 42in.RCP 1 ea 36in.RCP	1 ea 48in.RCP 1 ea 42in.RCP
	Pumping plant	30 ft of lift	25 ft of lift	25 ft of lift
Costs:	Instl. Ini.Cost	$3,583,000	$3,277,200	$2,783,400
	OM&R (Annual)	13,700	12,400	11,300
	Total Ann.Cost	$ 322,800	$ 295,100	$ 251,400
	Reduced Ann.Damg.	$ 240,000	$ 235,000	$ 214,000
	Ben./Cost Ratio	0.74:1	0.80:1	0.85:1

Effects: The 100 year peak discharge at McClure Road will be reduced from 626 cfs to the bypass rate of the selected reservoir. Under future without project conditions the buildings at J&B Industries will receive flood damages approximately once every 4 years. With the McClure reservoir installed, damages will not occur more frequently than once in 10 years. Land currently vacant or used for open storage will be converted to reservoir storage usage with the installation of this reservoir.

Upper Channel Modification -

Components: This consists of modifying 4,620 feet of the existing channel of Indian Creek from the East-West Tollway down to where Indian Creek flows under Farnsworth Avenue. An additional 7'x10' box culvert will be installed under Molitor Road and an additional 8'x8' box culvert will be installed under Farnsworth Avenue. The modified channel will require the excavation of approximately 22,000 cubic yards of material and the placement of rock rip-rap around the two curves north of Molitor Road. The new channel will have the following characteristics:

Location	Length	Bottom Width	Side Slopes
Tollway to Selmarten Creek	1,510 Ft.	18 Feet	2:1
Selmarten Cr. to Molitor Rd.	575 Ft.	20 Feet	2:1
Molitor Rd. to Sec. 187+15	1,440 Ft.	30 Feet	3:1
Sec. 187+15 to Farnsworth Ave.	1,035 Ft.	24 Feet	3:1

Costs: The estimated installation cost is $562,000. On an annual basis this element will cost $49,900 that includes $1,400 for annual OM&R.

Effects: The new channel and culverts will reduce average annual damages in the Upper Indian Creek and Selmarten Creek damage areas by approximately $79,500. For the future without project conditions it is estimated that 64 buildings are subject to 100 year flood damage. With this element installed 41 buildings would still be subject to damage by the 100 year event. For smaller storms this element is much more effective ie: for 10 year frequency flood w/o project 49 buildings, with upper channel 4 buildings are subject to flood damage.

The installation of this channel without upstream storage will increase peak discharges in the middle damage reach of Indian Creek. For the 100 year flood the increase is less than 10% while for smaller storms the increase can be as much as 16%. This will increase damages in the middle reach by as much as $4,000 annually.

Most of this portion of Indian Creek is bordered by apartment houses, condominiums, or single family residences, lawns or parking lots. Common trees include basswood, ash, and willow. A total of 4 acres of land currently in trees, parking lots or lawns will be converted to open channel.

Net benefits total $79,500 annually.

The Benefit/Cost Ratio for this element is 1.59:1.

Middle Channel Modification -
Components: This consists of modifying 3,570 feet of Indian Creek channel between the private drive located approximately 1,200 feet north of Sheffer Road and where Indian Creek flows under Farnsworth Avenue for the last time. The enlarged channel will have a 20 foot bottom and have 3:1 side slopes and will require the excavation of 8,600 cubic yards of material. The existing bridge at Sheffer Road will be cleaned out and its bottom lowered by 1 foot. The existing two private road bridges located south of Sheffer Road will be removed and replaced by one new bridge with a 40 foot span. In addition the two existing pipes through Farnsworth Avenue will be replaced with 3 each 10'x10' box culverts.

Costs: The estimated installation cost is $467,000. On an annual basis this element will cost $41,300 which includes $1,000 for OM&R.

Effects: The residential damages occurring in the Middle Indian Creek reach will be reduced by approximately $4,800 annually. Most of these damages occur to the two residences located along the channel north of Sheffer Road. In addition the traffic on Farnsworth Avenue will benefit by not having to be rerouted as often as it is with the present channel because of flood water on the road. Under future without project conditions water will be 6 inches deep or deeper on Farnsworth (elev. 693.5) approximately once every 4 years. With the middle channel modification it will reach elevation 693.5 only once every 25 years. Benefits for this reduced traffic interruption is estimated to be $630 annually.

Land use along this section is lawns of single family residences,open space, and some scattered trees and shrubs along the banks.

The estimated Benefit/Cost Ratio for the Middle Channel Modification is 0.13:1.

Outlet Channel Modification -
Components: Excavation of 7,100 cubic yards to construct a new channel from Highway 25 (Broadway) to the Fox River. The new channel will be concrete lined for 500 feet from Highway 25 to the railroad spur, and rock rip-rapped for the last 140 feet. The concrete lined portion will have a 30 foot bottom with vertical sidewalls. The rock rip-rapped portion will have a 30 foot bottom and 3:1 side slopes. One existing storage building would be removed

and one corner of the existing crane system at Garbe Steel would need to be relocated. Two new bridges with 34 foot spans would be installed over the new channel.

Costs: The estimated installation cost is $796,200. The annual cost is $71,700 which includes $3,000 for OM&R.

Effects: The installation of this channel will reduce the Indian Creek flood profiles by 3 to 5 feet. It will provide 100 year protection to all buildings presently flooded downstream of Highway 25. Existing traffic interruptions due to Indian Creek flooding will be reduced to less than once every 50 years if debris is kept out of the bridge opening. One building and one leg of the existing crane system will need to be removed or relocated. Approximately 0.5 acres of land currently used for storage yard, or open space will be converted to channel usage. The old channel will be filled with the material excavated from the new channel.

Annual building damage will be reduced from $72,400 to $400.
Annual traffic damage will be reduced from $1500 to $500.

The estimated Benefit/Cost Ratio is 1.02:1.

Eastview Dike -
Components: This consists of placing 24,000 cubic yards of earth fill in a ring dike around the subdivision. The dike will be 5,340 feet long with 1,300 feet of this length consisting of raising Molitor Road 2.5 to 3.5 feet. The remainder of the dike will have a 10 foot top width and 3 to 1 side slopes. The dike will vary from 2 feet to 6 feet above existing ground level. A pumping plant will be required along with a flap gate on the existing storm sewer. A flood gate will be installed across Felton Road. A flood easement will be purchased for the 70 acres to the east and south of the dike where flood water elevations will be increased by approximately 0.5 feet.

Effects: The dike will prevent overland flow from entering the subdivision. Purchase of the flood easements on 70 acres of floodplain located east and south of the dike will allow the storage of approximately 35 acre feet currently stored in Eastview Estates. Depth of flooding in this area will increase by 0.5 feet. Approximately 34 acres of land currently platted for residential development will be dedicated to flood storage usage. Back yards of 10 to 12 houses will be reduced in size because of placement of the dike between the houses and tributary B on the south side of Eastview Estates. Visibility from many of the houses on the west side of the subdivision will be restricted by the height of the dike. A total of 75 acres will be dedicated to either flood storage or dike usage. The flood storage area could continue to be used as farmland but could not be used for urban development. Local landowners do not feel this is a viable alternative.

Estimated annual damage reduction to the subdivision is $87,000.

Estimated benefit/cost ratio is 0.89:1.

Combinations of Structural Measures
Different combinations of the structural measures were evaluated during the preparation of this report. A table presenting the results of these analyses can be found in Appendix G.

Mitigation Plantings:

Construction of excavated reservoirs, dikes, diversions and channels for flood reduction purposes will inadvertently remove valuable trees, shrubs and other vegetation. Careful replacement of vegetation after construction will greatly reduce the unsightly effects of construction and can replace many of the wildlife habitat elements that will be lost to construction. Consideration should be given to recreating a tree lined channel particularly for the benefit of songbirds. Woody vegetation around the reservoirs will also provide screening and habitat for wildlife. It is recognized that maintenance needs may require setting the woody vegetation back from the channel or reservoir, but with that possible constraint in mind, the woody vegetation should be planted as close as possible to the water. The following plants are suited to both Drummer and Milford silty clay loam soils and are recommended for re-establishing habitat conditions and landscaping around construction sites:

Shrubs	Trees
gray dogwood	northern white cedar
silky dogwood	green ash
red-osier dogwood	red maple
arrowwood viburnum	cottonwood
American cranberrybush	sycamore
nannyberry	pin oak
Washington hawthorn	Norway spruce
amur honeysuckle	blue spruce
	black spruce (wet sites)

Several floodplain management strategies were evaluated including a) no action, b) nonstructural measures, c) structural measures, and d) a combination of measures. A brief description of the alternatives follows: (See Appendix C for sketches of the different structural measures and Appendix D for cost details.)

Alternative A - Future Without Project (No Action)

Components: This alternative assumes no additional action beyond what is currently being done in the watershed. All new development will be regulated by the City of Aurora, Kane County or DuPage County. The new development will need to meet the City of Aurora's new on-site detention ordinance (Dec. 1984). This ordinance requires all new development to provide between 2 inches and 4 inches of storage for the area being developed with a low release rate ie: 0.1 to 0.15 cfs/acre. Where a significant portion of the upstream area is developed with this type on-site detention, the peak discharges will be reduced from present conditions. Existing homeowners in floodprone areas will continue to purchase flood insurance to reduce the financial impact of flooding. Areas currently experiencing flood damages will continue to experience flood damages.

Costs: The costs of this alternative will be determined by the number of individuals who purchase flood insurance ($150 + per household per year) and the costs to the local governments for implementation of floodplain regulations.

Effects: The average annual damages will decrease slightly as peak discharges are reduced in areas in response to the additional development with on-site detention. A total of 156 buildings will still be flooded by the 1% chance flood. Many existing home owners and business owners will attempt to relocate due to the uncertainty of when their property will be damaged. The City of Aurora will continue to receive complaints about flooding and will be monitoring flood levels on the Indian Creek and Tributaries during all storm events. It is estimated average annual damages will be $525,900 per year in 2005.

Alternative B - Nonstructural Measures

Components: The primary components consist of administrative actions such as zoning, on-site detention requirements, building codes or flood insurance and non-structural measures such as a flood warning system, floodproofing which includes low dikes or fills, sewer check valves, and a flap gate on the Eastview Estates storm sewer. All local governments in the detailed study area are currently cooperating with the National Flood Insurance Program and flood insurance is available for all residents of the floodprone areas shown on the floodplain maps. The maps and profiles prepared as part of this report are provided for possible revision of the regulatory maps for the areas involved. It is estimated that 50 homeowners would be willing to construct flood protection (floodproofing) measures consisting of low fills of 6 inches or less around their houses and raising existing window wells for the lower story of their homes. These measures will reduce frequency of flooding by keeping water out of basements until water is deep enough to enter first floors. Many of the existing homeowners are already installing check valves on their sewer lines to prevent sewer backup. The city is in the process of installing a flap gate on the storm sewer from Eastview Estates to prevent

Indian Creek floodwater from backing into Eastview Estates. The city has scheduled the construction of a pumping plant in Eastview Estates to remove ponded water that will collect when the flap gate closes.

Costs: It is estimated that flood insurance will cost $150/building or $30,000 per year. The floodproofing of homes would cost $150,000 with an estimated annual cost of $20,000 including $7,100 annual O&M. The flood warning system consists of monitoring Indian Creek flows and warning floodprone areas when water is approaching bankfull at Molitor Road. Estimated cost to do this is $3000 per year. Currently a local citizens group is watching the creek and warning people when it starts flooding. The total installation cost of this alternative is $150,000 for floodproofing with an annual cost of $20,000 which includes OM&R, $30,000 for flood insurance and $3,000 for Flood Warning System. Total annual cost = $53,000.

Effects: All residences subject to damage by floodwater would have the peace of mind of knowing the flood insurance policies would cover them for damages over $200 in a given year. The 50 properties where the floodproofing measures, consisting of 6 inches of fill and raising existing window wells, are installed will see their annual damages reduced by a total of approximately $48,000 per year. All of these 50 properties will still be subject to damage by the 100 year and 500 year floods. A total of 156 buildings will still be subject to damage by the 1% chance (100 year) flood.

All residents who install the sewer check valves will reduce the worry and damages from sewer backup. Damages to property from sewer backup has not been estimated as part of this study.

The Benefit/Cost Ratio for floodproofing the 50 properties is 2.4:1.

Remaining average annual damages would be $477,900.

Alternative C - Maximum protection using a combination of structural and non-structural measures

This alternative is a combination of structural measures and flood proofing that maximizes the level of protection provided to damaged properties while maintaining a benefit/cost ratio as close as possible to 1 to 1.

Components: Structural elements included are upper channel on Indian Creek, outlet channel on Indian Creek, Reservoir 14, Reservoir 86, Reservoir 87 and McClure Reservoir with 150 cfs bypass. Non-structural elements included are floodplain regulations, on-site detention, and flood proofing to 20 buildings. A more detailed description of the structural elements is in the section titled structural elements evaluated and for the non-structural elements in Alternative B.

Costs: The total cost of this alternative is $6,797,200 with average annual costs estimated to be $609,700 which includes OM&R of $23,300.

Effects: Reservoir 14 is needed with the installation of the upper channel to keep the peaks downstream of the upper channel from increasing above present levels, therefore they are considered together in the analysis. The combined flood storage of the four reservoirs is 427 acre feet which includes some natural storage beyond the constructed boundaries of the reservoir particularly in the gravity outflow type reservoirs. Reservoir 14 reduces the 100 year peak discharge on Selmarten Creek from 589 cfs to 330 cfs at the East-West Tollroad. The upper channel will reduce flooding of buildings from

64 buildings to 41 buildings for the 100 year flood under future runoff conditions and from 49 buildings to 4 buildings for the 10 year flood. Reservoirs 85 and 86 reduce the 100 year peak discharges that flow toward Eastview Estates from 130 cfs to 12 cfs and 304 cfs to 33 cfs respectively. McClure Reservoir reduces the 100 year peak discharge at McClure Road from 626 cfs to 150 cfs. The outlet channel modification will provide 100 year flood protection to all the buildings below Highway 25 that currently flood and provide 50 year protection to the Highway 25 flooding if proper debris maintenance is practiced.

Approximately 69 acres of land that is primarily farmland, lawns, or land with scattered willows and cottonwoods will be converted to reservoir or channel. Most of this land is zoned residential in the Aurora long range plan. An additional 4 acres of bottomland woods will remain as a natural preserved area that floods periodically now and will continue to be a natural flood area with Reservoir 14 constructed.

Flood proofing will effect 20 properties with flood damages reduced by approximately $14,600 per year. Floodwater damages to buildings will be reduced by $495,800. Floodwater damages to traffic will be reduced $1000. A total of 37 buildings will still be subject to damage by the 100 year flood.

The estimated Benefit/Cost Ratio = 0.81:1.

Alternative D - Maximum net benefits using structural and non-structural measures

This alternative is a combination of structural measures and flood proofing that maximizes the net benefits. The upper channel and reservoir 14 are considered an individual element because the upper channel, if built without Reservoir 14, would significantly increase peak discharges downstream.

Components: Structural elements included are outlet channel on Indian Creek, Reservoir 41, Reservoir 84, Upper Channel on Indian Creek and Reservoir 14. Non-structural elements included are floodplain regulations, on-site detention, and individual flood protection (floodproofing) to 20 buildings. There is a more detailed description of the structural elements in the structural measures evaluated section of this report and for the non-structural elements in the alternative B discussion.

Costs: The total cost of this alternative is $3,133,600 with average annual costs estimated to be $280,400 which includes OM&R of $10,100.

Effects: The combined flood storage of the three reservoirs is 177 acre feet which includes some natural storage beyond the constructed boundaries of the reservoirs. Reservoir 14 reduces the 100 year peak discharge on Selmarten Creek from 589 cfs to 330 cfs at the East-West Tollroad. The Upper Channel will reduce flooding of buildings from 64 buildings to 41 buildings for the 100 year flood under future runoff conditions and from 49 buildings to 4 buildings for the 10 year flood. Reservoirs 41 and 84 reduce the 100 year peak discharges that flow toward Eastview Estates from 130 cfs to 39 cfs and 304 cfs to 49 cfs respectively. The 100 year peak flow at Farnsworth Avenue near the nursing home will be reduced from 1420 to 1390 cfs by the installation of Alternative D measures.

The Outlet Channel modification will provide 100 year flood protection to all the buildings below Highway 25 that currently flood and provide 50 year protection to the Highway 25 from flooding if proper debris maintenance is practiced.

Approximately 45 acres of land that is primarily farmland, idle, or vacant land will be converted to reservoir or channel. An additional 4 acres of woods and wetland will remain as a natural preserved area that floods periodically now and will continue to be a natural flood area with the reservoir constructed.

Flood protection with low earth fills and raising the window wells of 20 properties will reduce damages to these properties by approximately $14,600 per year. Total reduction in flood water damages to buildings amount to $255,000. Floodwater damages to traffic will be reduced by $1000. A total of 55 buildings will still be subject to damage by the 100 year flood.

The estimated Benefit/Cost Ratio = 0.91:1.

INDIAN CREEK
. SUMMARY AND COMPARISON OF ALTERNATIVES 1/

ITEM	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
Components	On-site detention, Floodplain Regulation, Flood Insurance	Flood Insurance Floodproofing 50 buildings, sewer check valves, Flood Warning System	McClure Reservoir @ 150 cfs bypass, Upper Channel with Reservoir 14, Reservoir 86 & 87, Outlet Channel, Floodplain Regs, On-site Detention, Floodproofing 20 buildings, Flood Insurance	Upper Channel with Reservoir 14, Reservoir 41 & 84, Outlet Channel, Floodplain Regs, On-site Detention, Floodproofing 20 buildings, Flood Insurance
Total Project Installation Cost	----	$150,000	$6,797,200	$3,133,600
Annual Cost 2/	----	53,000	609,700	280,400
Annual Benefits	$ 70,000 3/	48,000	496,800 4/	256,000 4/
Net Annual Benefit	----	-5,000	-112,900	-24,400
Benefit/Cost Ratio	---	---	0.81:1	0.91:1
Remaining Damages	525,900	477,900	30,100	270,900
Number of Buildings Flooded (100 yr)	156	156	37	55
Notes:	Damages for present conditions estimated to be $595,900 with 161 buildings flooded by 100 year storm.	Benefits and Costs of sewer check valves not calculated. B/C Ratio from floodproofing is 2.4:1.	Reservoir 14 required to prevent increase discharges from Upper Channel construction.	Reservoir 14 required to prevent increased discharges from Upper Channel consruction.

1/ All costs, damages and benefits shown are in dollars.
2/ 100 year period with 8 5/8%.
3/ Comparing present damages with future without project damages.
4/ Includes $1000 benefits for reduced traffic disruptions.

ADDITIONAL STUDIES

The Illinois Division of Water Resources (DWR) is undertaking additional studies to refine some of the alternatives presented in this report. They are also investigating additional alternatives in the Eastview Estates area to alleviate the flooding problems. DWR will provide sufficient information so that the Steering Committee can make intelligent decisions as to the best manner in which to pursue project implementation.

Glossary

Avg. Annual Damage- The estimated average yearly damage expected to occur during the project evaluation periods.

Encroachment- Obstruction in part of a floodplain which reduces floodwater carrying capacity, therefore increasing flood stages.

Floodway- The portion of a floodplain required to convey floodwaters without causing significant increases in flood heights or velocities.

Floodway Fringe Area- Portions of the floodplain outside of the floodway subject to shallow inundation and low velocity flow.

Flood- An overflow of water onto land not normally covered by water. This inundation of land is temporary, and the land is normally adjacent to a river or stream, lake, or other body of water. Normally, a "flood" is considered as any temporary rise of stream flow or stage that causes a significant adverse effect. Adverse effects would be damage to property, sewer backup, creation of unsanitary conditions, erosion, sedimentation, accumulation of debris, traffic disruption or other problems.

Flood Crest- The maximum stage or elevation reached by the waters of flood at a given location. It may be referred to as flood stage or high water elevation.

Flood Peak- The maximum instantaneous discharge at a given location. It usually occurs at or near the time of the flood crest.

Floodplain- The relatively flat area or low lands adjoining the stream channel, or water course, lake, or other body of water, which has or may experience flood inundation.

Head Loss- The effect of natural or man-made obstructions such as small bridge openings, buildings, fill, or accumulation of debris which limits the conveyance of water, causing a rise in upstream waater surface elevation.

Profile- A graph showing the relationship of water surface elevation and natural ground elevations to location along the water course. The profile is normally drawn for a specific flood. Also referred to as water surface profile.

100 Year Flood- A flood having a 1% chance of being equalled or exceeded in any one year. It may occur in any year. It is based on a statistical analysis of precipitation and gage records. Also referred to as a flood with a 100 year recurrence interval.

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WS12:7

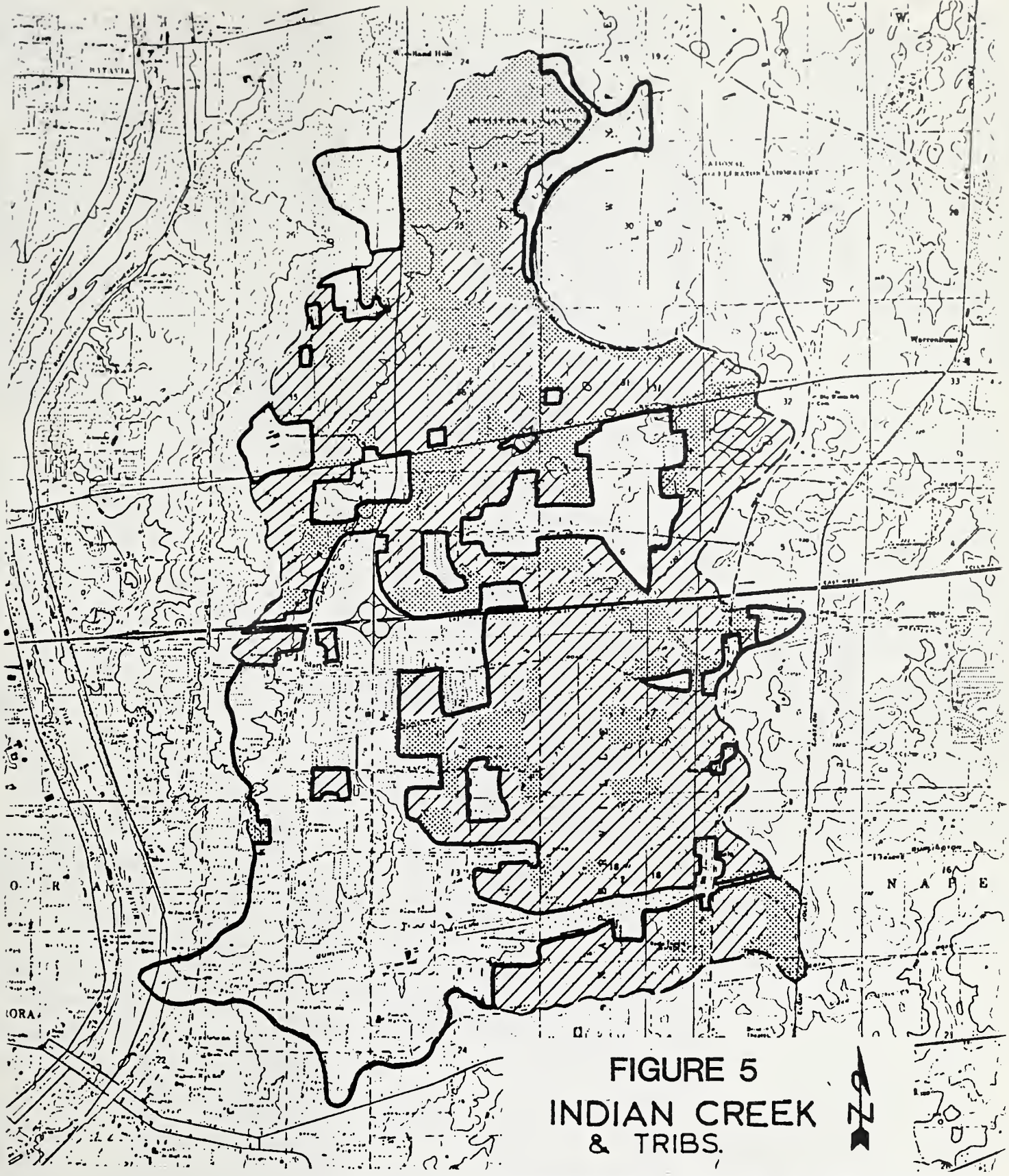


FIGURE 5
INDIAN CREEK
& TRIBS.

N

PRESENT LAND USE (1985)

Scale
1/2 0 1 mile

URBAN

CROPLAND

GRASSLAND and WOODLAND

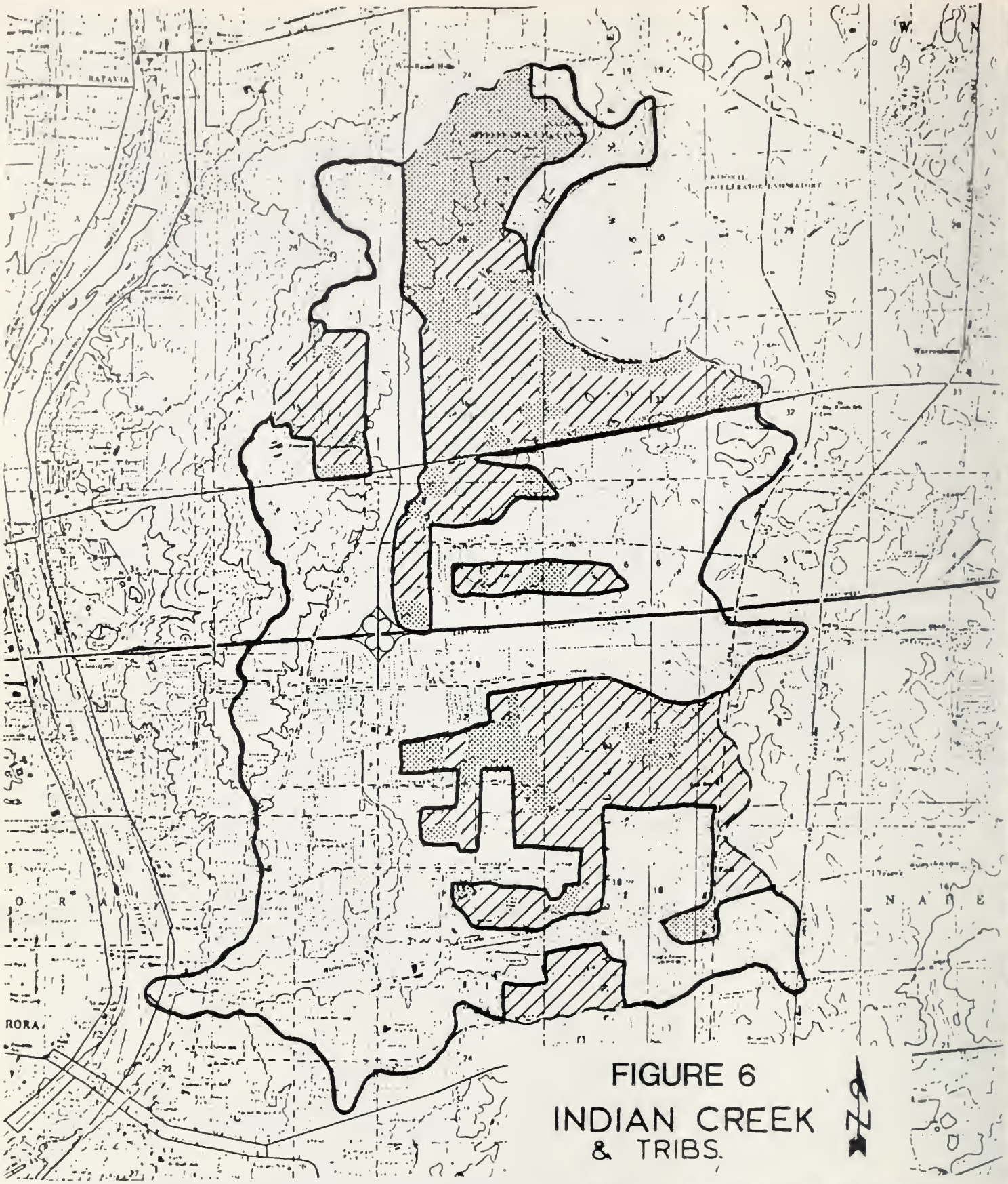


FIGURE 6

INDIAN CREEK & TRIBS.

N

Scale

½ 0 1 mile

FUTURE LAND USE (2005)

URBAN

CROPLAND

GRASSLAND and WOODLAND

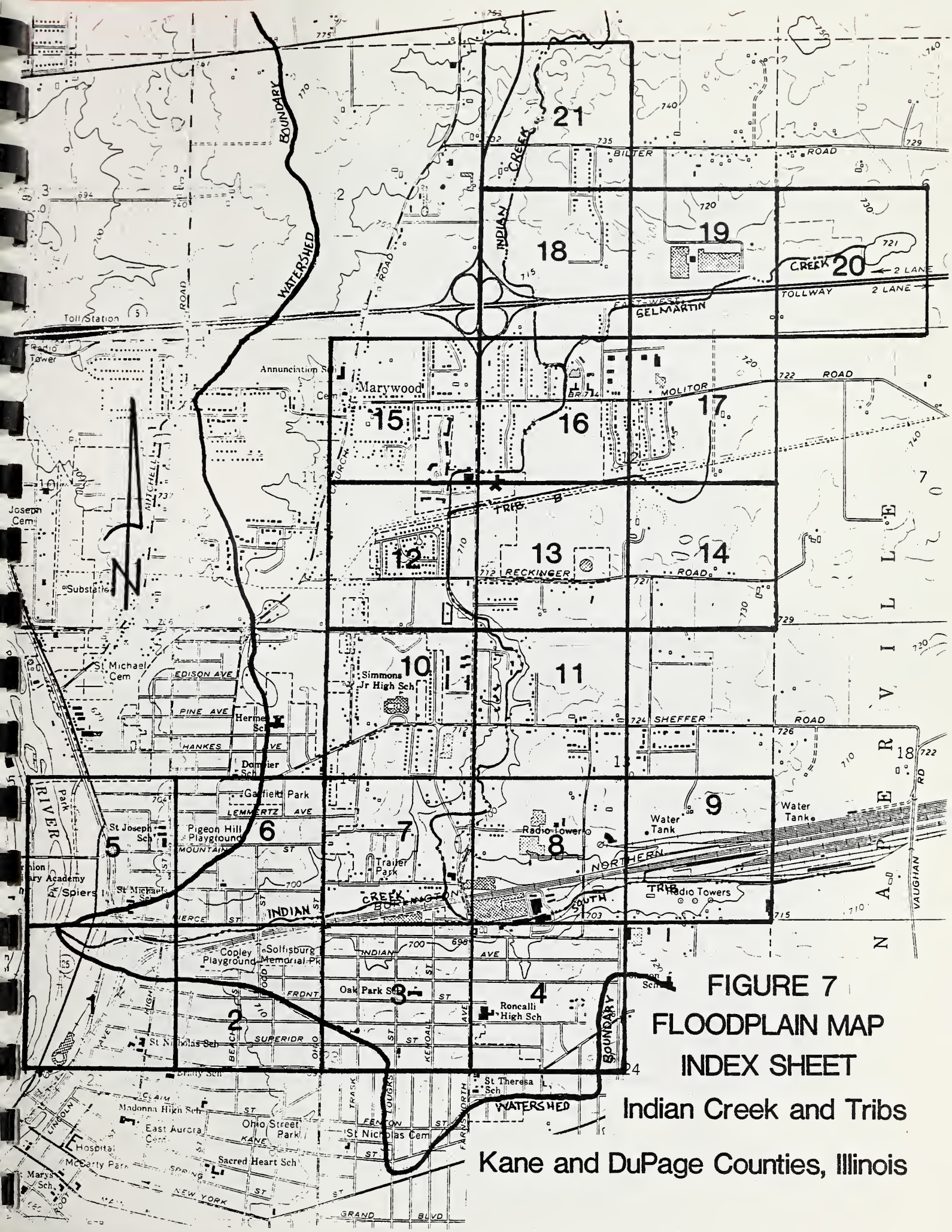


FIGURE 7
FLOODPLAIN MAP
INDEX SHEET
Indian Creek and Tribs
Kane and DuPage Counties, Illinois

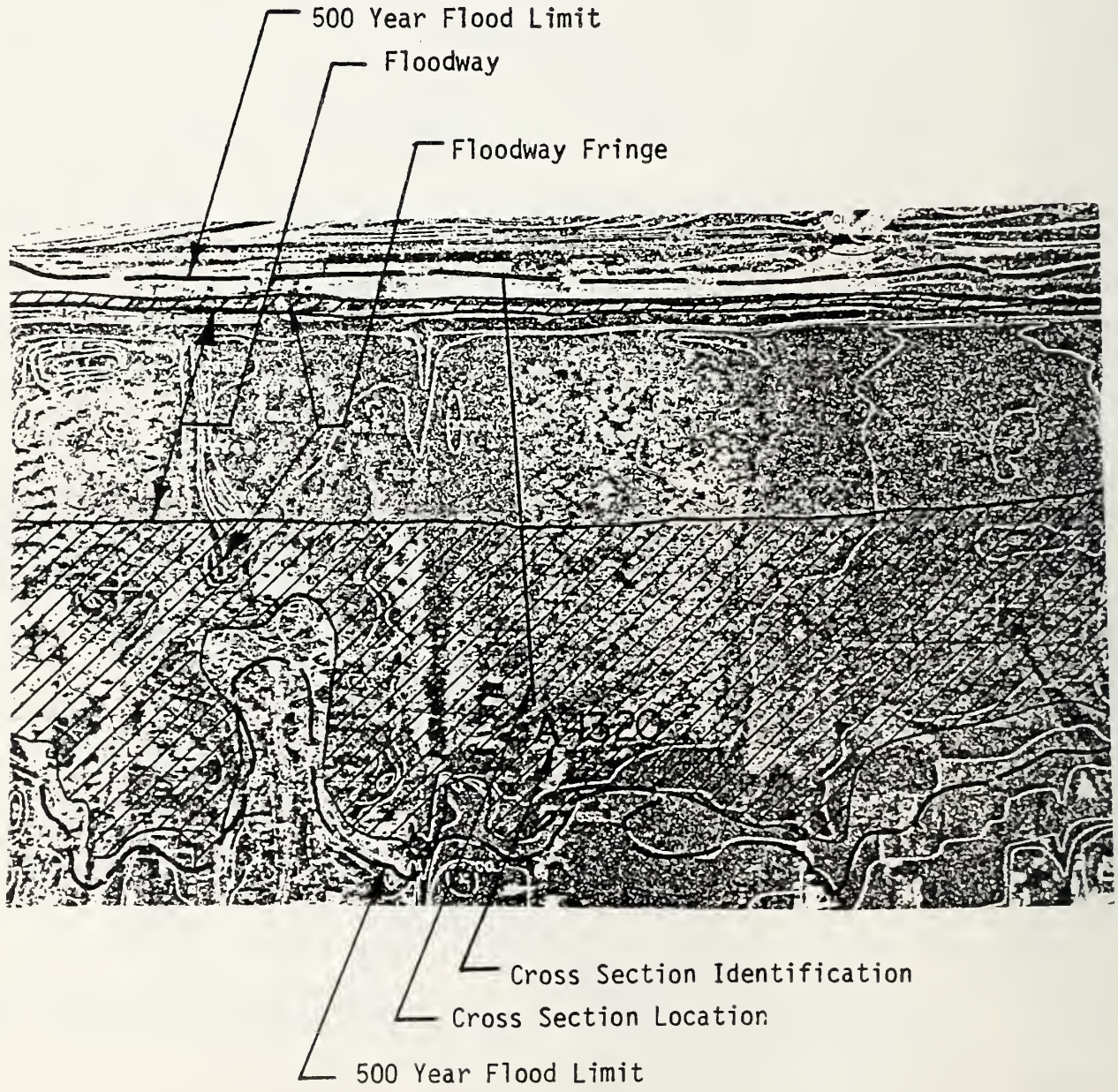
INDIAN CREEK AND TRIBUTARIES

FLOOD PLAIN INFORMATION MAPS

The following maps describe the existing flood hazard for Indian Creek, Selmarten Creek, Tributary B, and South Tributary in and near the City of Aurora, Illinois.

The maps show: 1) the location of cross sections used in the hyraulic analysis, 2) the floodway which is the minimum area required to convey the 100 year flood, 3) the remaining portion of the 100 year floodplain called the floodway fringe, 4) the limits of the area subject to being flooded by the 500 year flood.

The following drawing shows how the floodway, flooding fringe and 500 year flood limits area are shown on the maps in the report.



INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 715 Section I.D.

SHEET 1

ORTHOPHOTOGRAPHIC MAPPING OF
NE1/4, SEC. 22, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

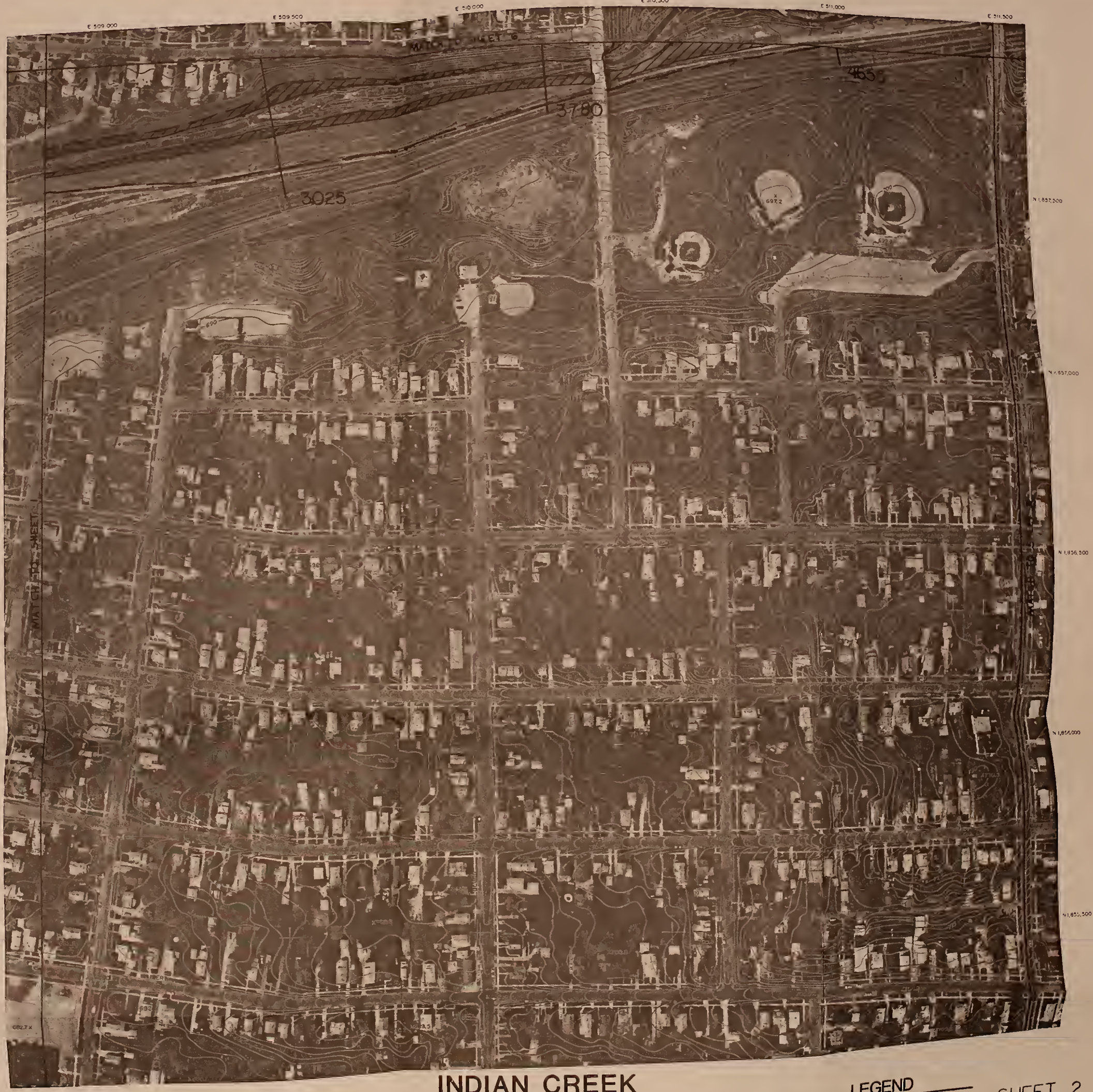
DATE OF PHOTOGRAPHY: 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7, 3.6 OF THE MANUAL OF PHOTOGRAM. ETR/, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986



INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 3780 Section I.D.

SHEET 2

ORTHOPHOTOGRAPHIC MAPPING OF NW1/4, SEC. 23, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-28-84

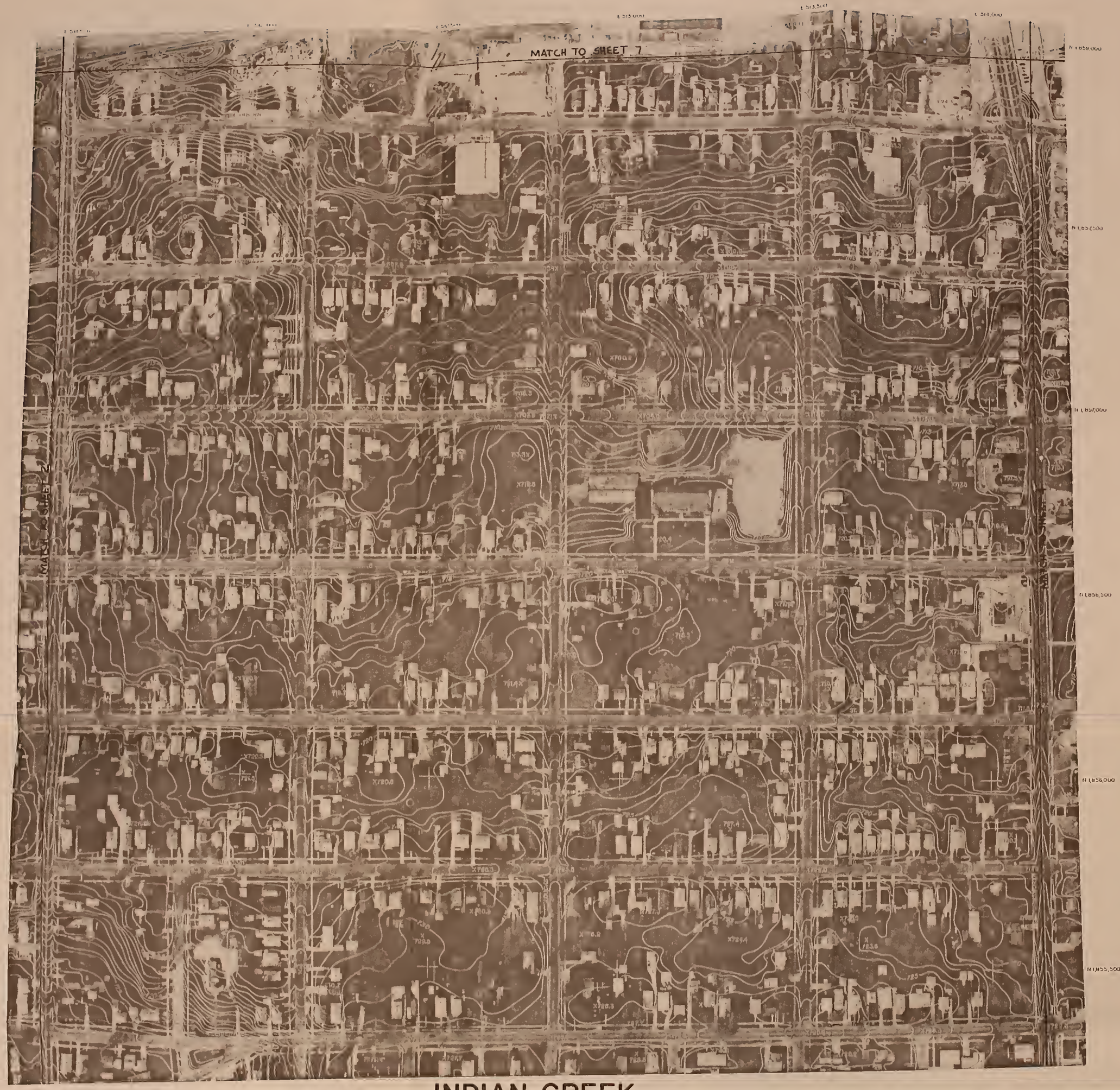
AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET

0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986



INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO 848407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- A480 Section I.D.

SHEET 3

ORTHOPHOTOGRAPHIC MAPPING OF
NE1/4, SEC. 23, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- A1170 Section I.D.

SHEET 4

ORTHOPHOTOGRAPHIC MAPPING OF
NW1/4, SEC. 24, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

E 507,000 E 507,500 E 508,000 N 508,500 E 509,000

N 1,860,500

N 1,860,000

N 1,859,500

N 1,859,000

N 1,858,500

N 1,858,000

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 125 Section I.D.

SHEET 5

ORTHOPHOTOGRAPHIC MAPPING
OF
SE1/4, SEC. 15, T38N, R8 E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 4655 Section I.D.

SHEET 6

ORTHOPHOTOGRAPHIC MAPPING OF
SW1/4, SEC. 14, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 6100 Section I.D.

SHEET 7

ORTHOPHOTOGRAPHIC MAPPING OF SE1/4, SEC. 14, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-26-64

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

USDA SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX 1986

INDIAN CREEK FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- A3030 Section I.D.

SHEET 8

ORTHOPHOTOGRAPHIC MAPPING OF SW1/4, SEC. 13, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- A4320 Section I.D.

SHEET 9

ORTHOPHOTOGRAPHIC MAPPING OF
SE1/4, SEC. 13, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 848407

NOTE: DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 11770 Section I.D.

SHEET 10

ORTHOPHOTOGRAPHIC MAPPING OF
NE1/4, SEC. 14, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX 1986

INDIAN CREEK FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 11770 Section I.D.

SHEET 11

ORTHOPHOTOGRAPHIC MAPPING OF NW1/4, SEC. 13, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET

0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

N

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 14320 Section I.D.

SHEET 12

ORTHORHOTOGRAPHIC MAPPING OF
SE1/4, SEC. 11, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

E 514,000 E 514,500 E 515,000 E 515,500 E 516,000 E 516,500

N 1,866,000 N 1,865,500 N 1,865,000 N 1,864,500 N 1,864,000 N 1,863,500

MATCH TO SHEET 12

MATCH TO SHEET 14

FARNSWORTH AVE.

B530

B930

B1715

B2270

B2780

1085

5095

TO SHEET 11

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- B1715 Section I.D.

SHEET 13

ORTHOPHOTOGRAPHIC MAPPING OF SW1/4, SEC. 12, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-26-84

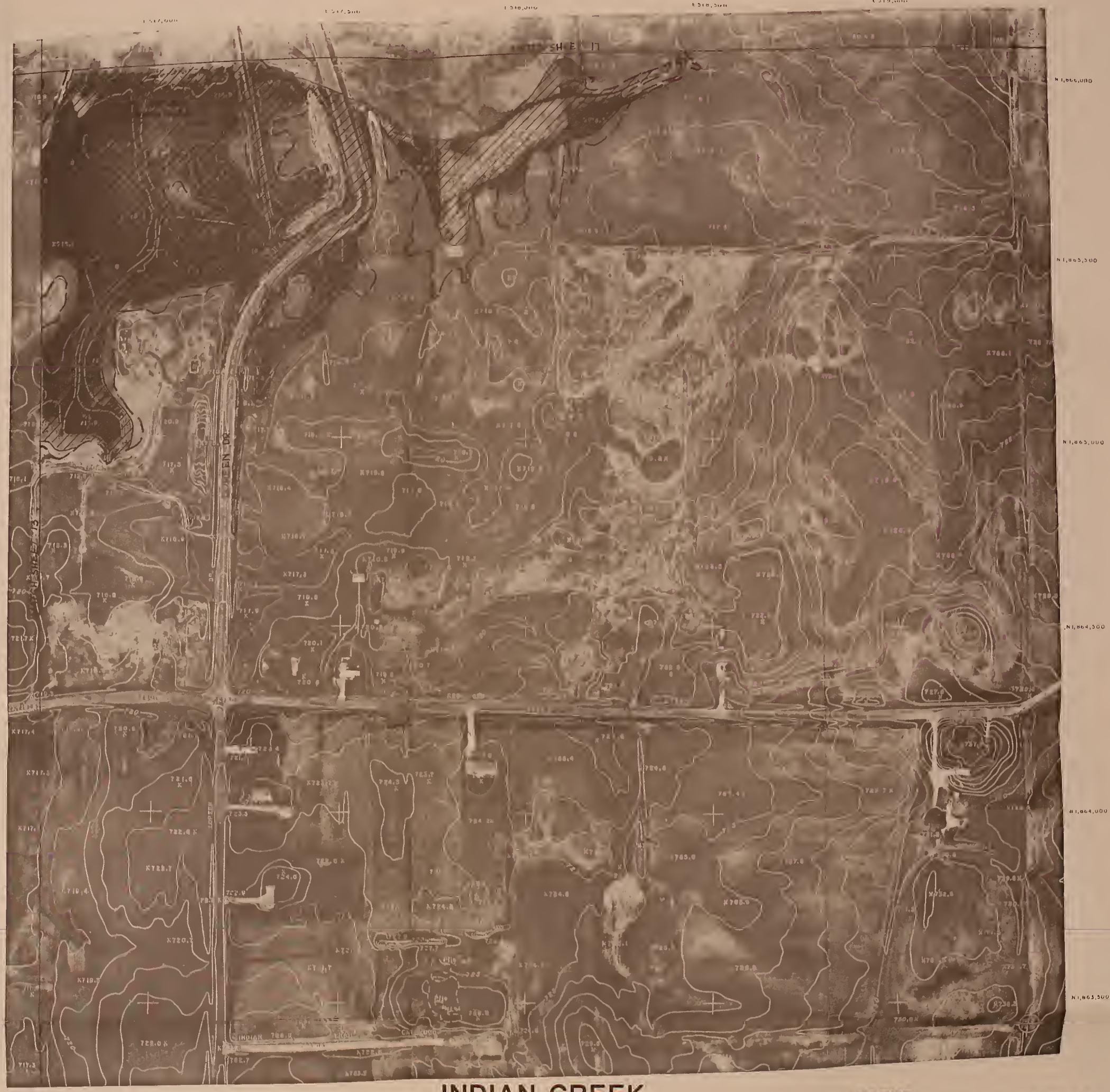
AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET

0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986



INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO 84807

N

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- B2780 Section I.D.

SHEET 14

ORTHOPHOTOGRAPHIC MAPPING OF
SE1/4, SEC. 12, T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- 17290 Section I.D.

SHEET 15

ORTHOPHOTOGRAPHIC MAPPING OF NE1/4, SEC. 11, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- B2770 Section I.D.

SHEET 16

ORTHOPHOTOGRAPHIC MAPPING OF NW1/4, SEC. 12, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY: 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 848407

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

E 517,000 E 517,500 E 518,000 E 518,500 E 519,000

N 1,868,500

N 1,868,000

N 1,867,500

N 1,867,000

N 1,866,500

N 1,866,000

MATCH TO SHEET

MATCH TO SHEET

S 3080

S 2025

B 3725

B 4335

B 3985

MOLITOR RD

NOTE: NATURAL PONDING AREA THAT STORES FLOOD-WATER

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

N

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET

0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location

B4335 Section I.D.

SHEET 17

ORTHOPHOTOGRAPHIC MAPPING OF NE1/4, SEC. 12, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

E 514,000 E 514,500 E 515,000 E 515,500 E 516,000 E 516,500

N 1,871,000 N 1,870,500 N 1,870,000 N 1,869,500 N 1,869,000 N 1,868,500

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- S805 Section I.D.

SHEET 18

ORTHOPHOTOGRAPHIC MAPPING OF
SW1/4, SEC. 1 , T38N, R8E
PREPARED FOR
CITY OF AURORA
PREPARED BY
AERO-METRIC ENGINEERING, INC.
SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

E 517,000 E 517,500 E 518,000 E 518,500

LIMIT OF STUDY

N 1,871,000

N 1,870,300

N 1,870,000

MATCH TO SHEET 18

N 1,869,300

N 1,869,000

EAST WEST TOLLWAY

S3080

S3025

S4010

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-26-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET

0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- S4010 Section I.D.

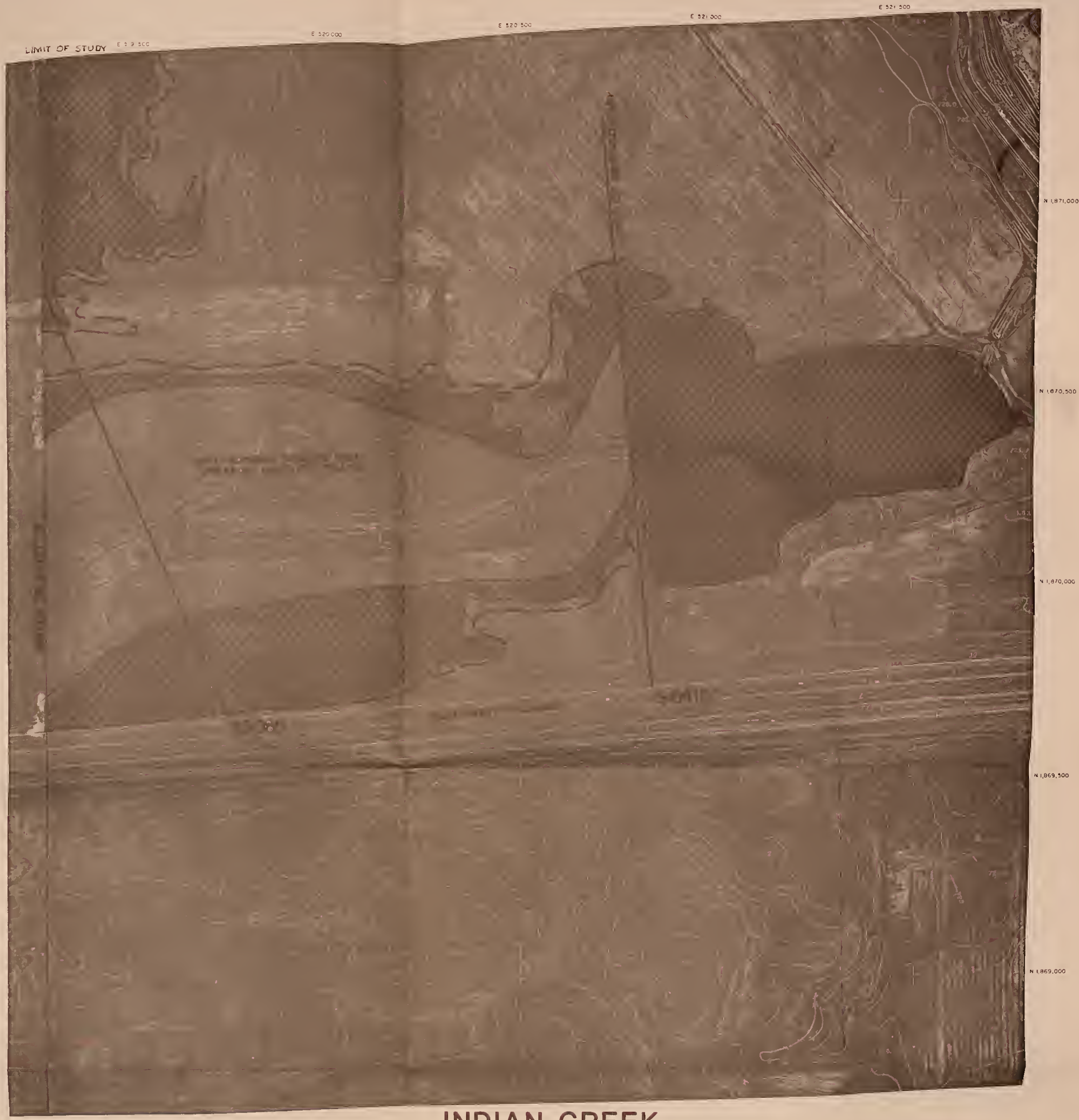
SHEET 19

ORTHOPHOTOGRAPHIC MAPPING OF SE1/4, SEC. 1, T38N, R8E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986



INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-64

AERO-METRIC ENGINEERING PROJECT NO. 048407

N

NOTE DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- Floodway Fringe
- Floodway
- 500yr limit
- Section Location
- S6415 Section I.D.

SHEET 20

ORTHOPHOTOGRAPHIC MAPPING OF SW1/4, SEC. 6, T38N, R9E

PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986

APPENDICES

E 514,000 E 514,500 E 515,000 E 515,500 E 516,000 E 516,500

N 1,874,000
N 1,873,500
N 1,873,000
N 1,872,500
N 1,872,000
N 1,871,500

INDIAN CREEK
FLOODPLAIN MAP

prepared by Soil Conservation Service

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR ONE FOOT CONTOUR INTERVAL MAPPING.

CONTOUR INTERVAL OF ONE FOOT BASED ON MEAN SEA LEVEL DATUM.

HORIZONTAL DATUM BASED ON THE ILLINOIS STATE PLANE COORDINATE SYSTEM.

DATE OF PHOTOGRAPHY 4-28-84

AERO-METRIC ENGINEERING PROJECT NO. 048407

NOTE. DASHED CONTOURS INDICATE APPROXIMATE ELEVATIONS AS DEFINED IN PARAGRAPH 7.1.3.6 OF THE MANUAL OF PHOTOGRAMMETRY, 4th EDITION.

0 100 200 300 400 500 FEET
0 30.48 60.96 91.44 121.92 152.40 METERS

LEGEND

- 500yr limit
- Floodway
- Floodway Fringe
- Section Location
- 25540 Cross Section I.D.

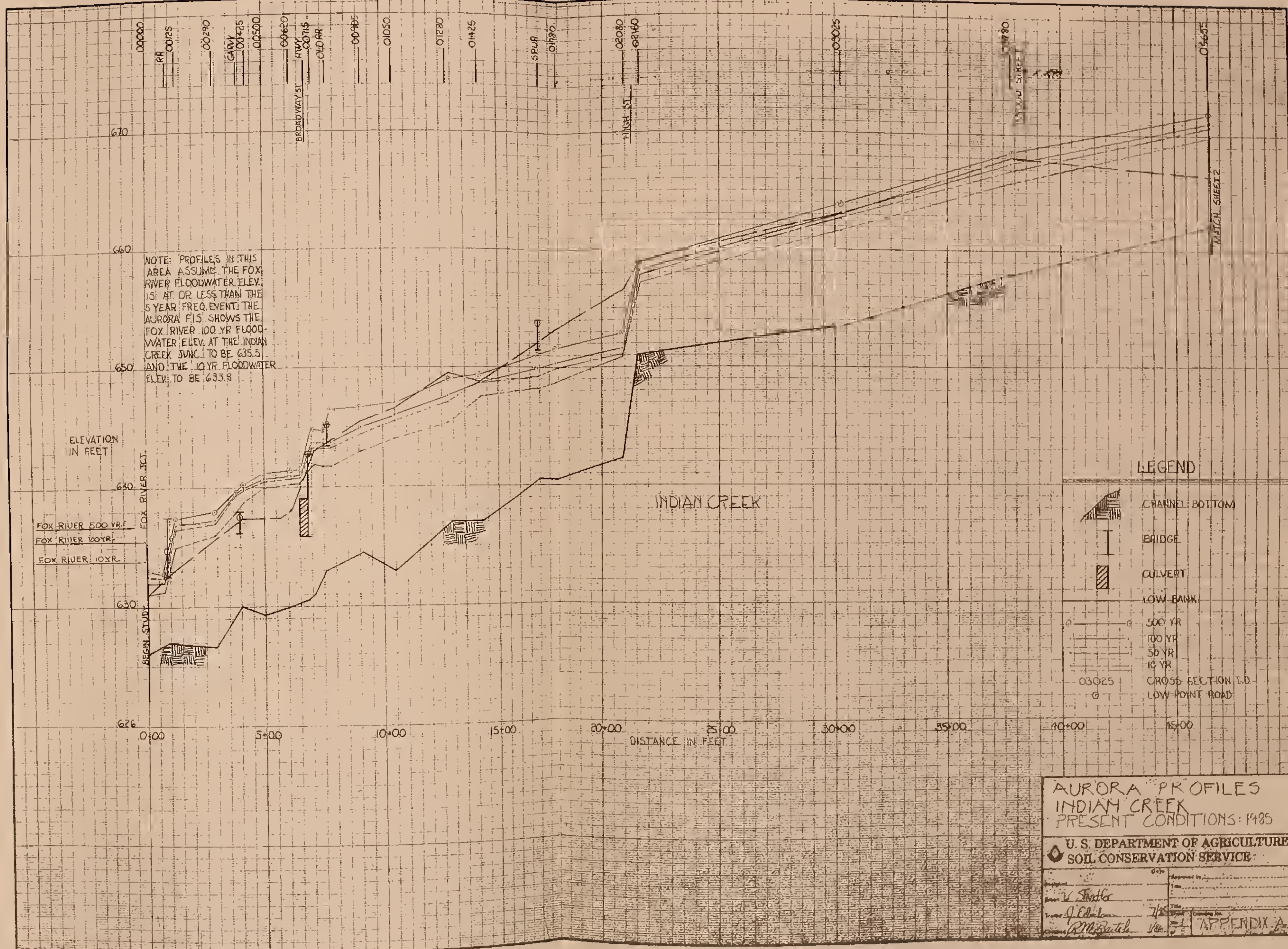
SHEET 21

ORTHOPHOTOGRAPHIC MAPPING OF NW1/4, SEC. 1 , T38N, R8E

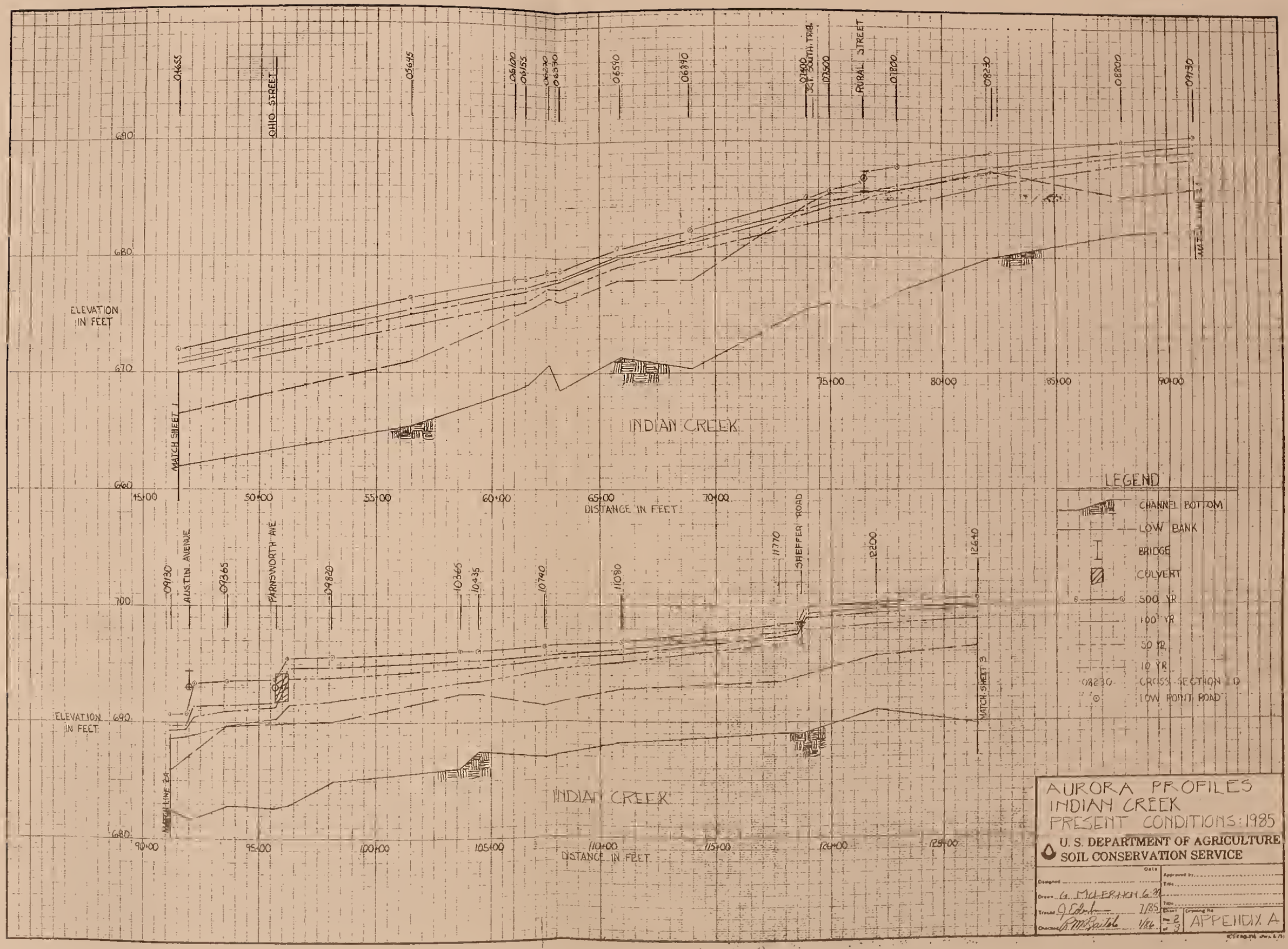
PREPARED FOR CITY OF AURORA

PREPARED BY AERO-METRIC ENGINEERING, INC. SHEBOYGAN, WISCONSIN

USDA-SCS-NATIONAL MAPPING DIVISION, FT. WORTH, TX. 1986



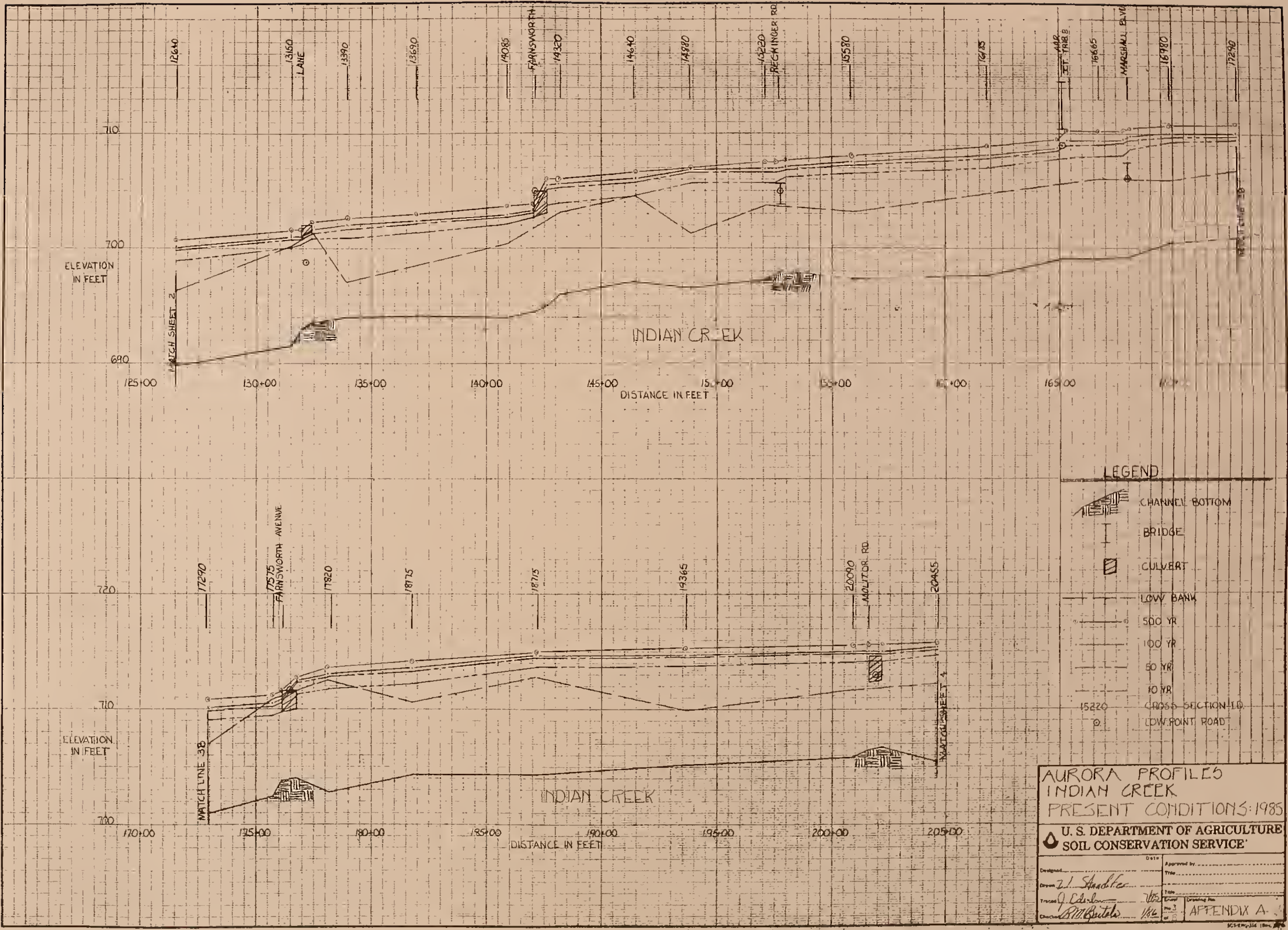
00000
RR
00125
00290
GARY
00425
00500
00620
HWY
00715
OLD RR
00905
01050
01280
01425
SPUR
01590
02080
02160
03025
BROADWAY ST.
HIGH ST.
MATCH SHEET 2
NOTE: PROFILES IN THIS AREA ASSUME THE FOX RIVER FLOODWATER ELEV. IS AT OR LESS THAN THE 5 YEAR FREQ. EVENT. THE AURORA F.I.S. SHOWS THE FOX RIVER 100 YR FLOODWATER ELEV. AT THE INDIAN CREEK JUNC. TO BE 635.5 AND THE 10 YR FLOODWATER ELEV. TO BE 633.8
670
660
650
640
630
626
ELEVATION IN FEET
FOX RIVER JCT.
BEGIN STUDY
FOX RIVER 500 YR.
FOX RIVER 100YR.
FOX RIVER 10YR.
INDIAN CREEK
0+00
5+00
10+00
15+00
20+00
25+00
30+00
35+00
40+00
45+00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
BRIDGE
CULVERT
LOW BANK
500 YR
100 YR
50 YR
10 YR
03025 CROSS SECTION I.D.
LOW POINT ROAD
AURORA PROFILES
INDIAN CREEK
PRESENT CONDITIONS: 1985
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A

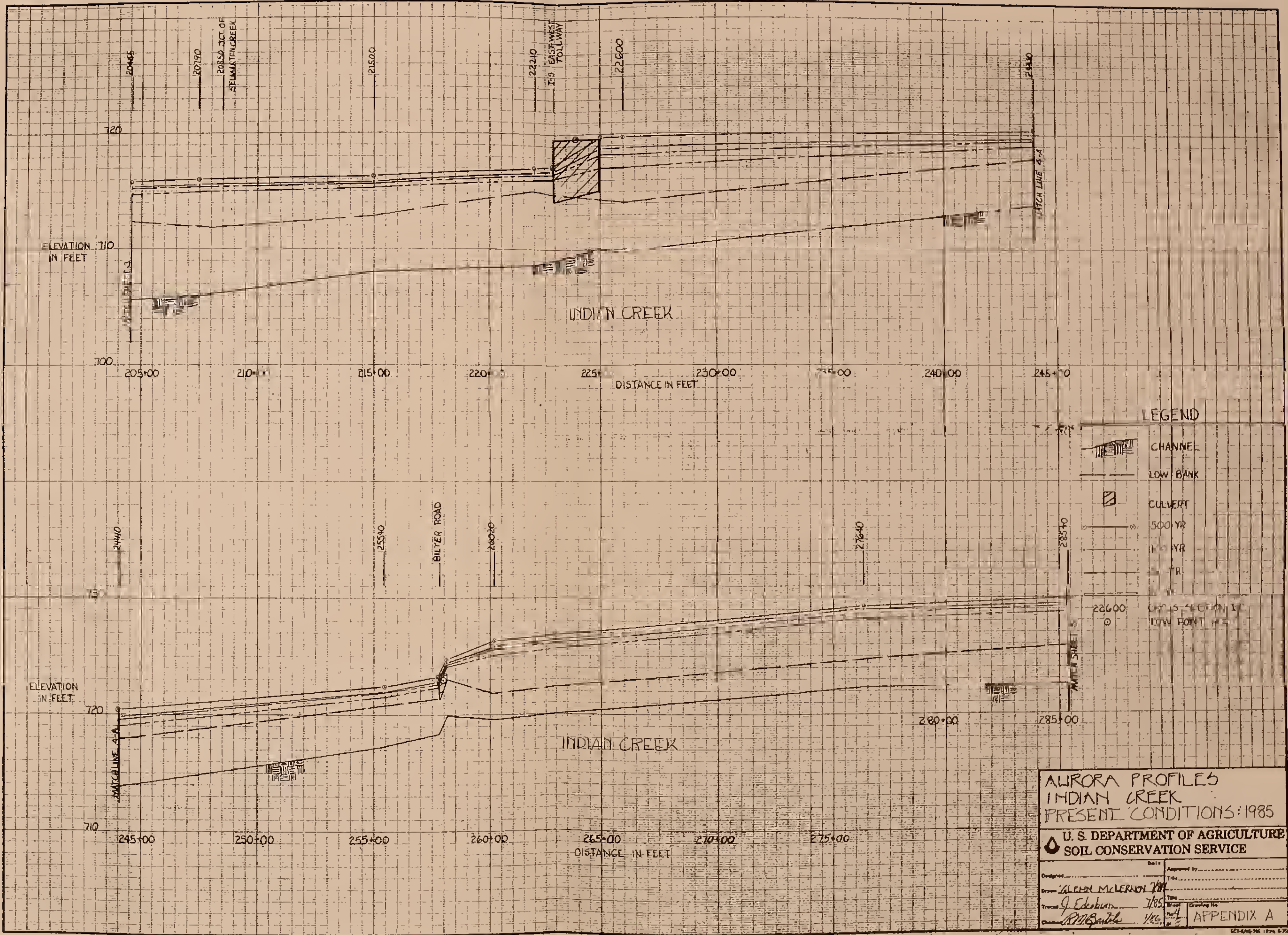


AURORA PROFILES
INDIAN CREEK
PRESENT CONDITIONS: 1985

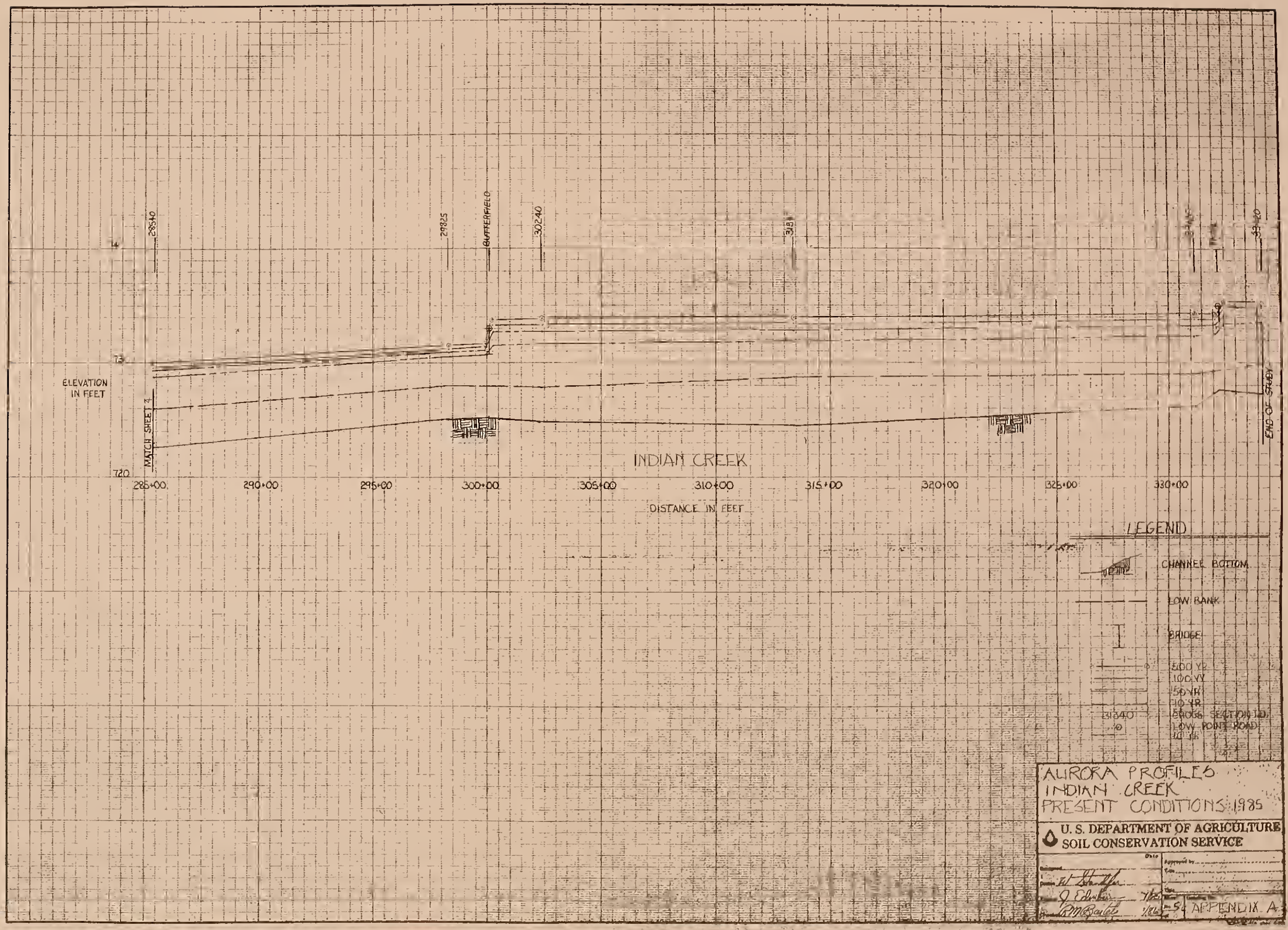
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

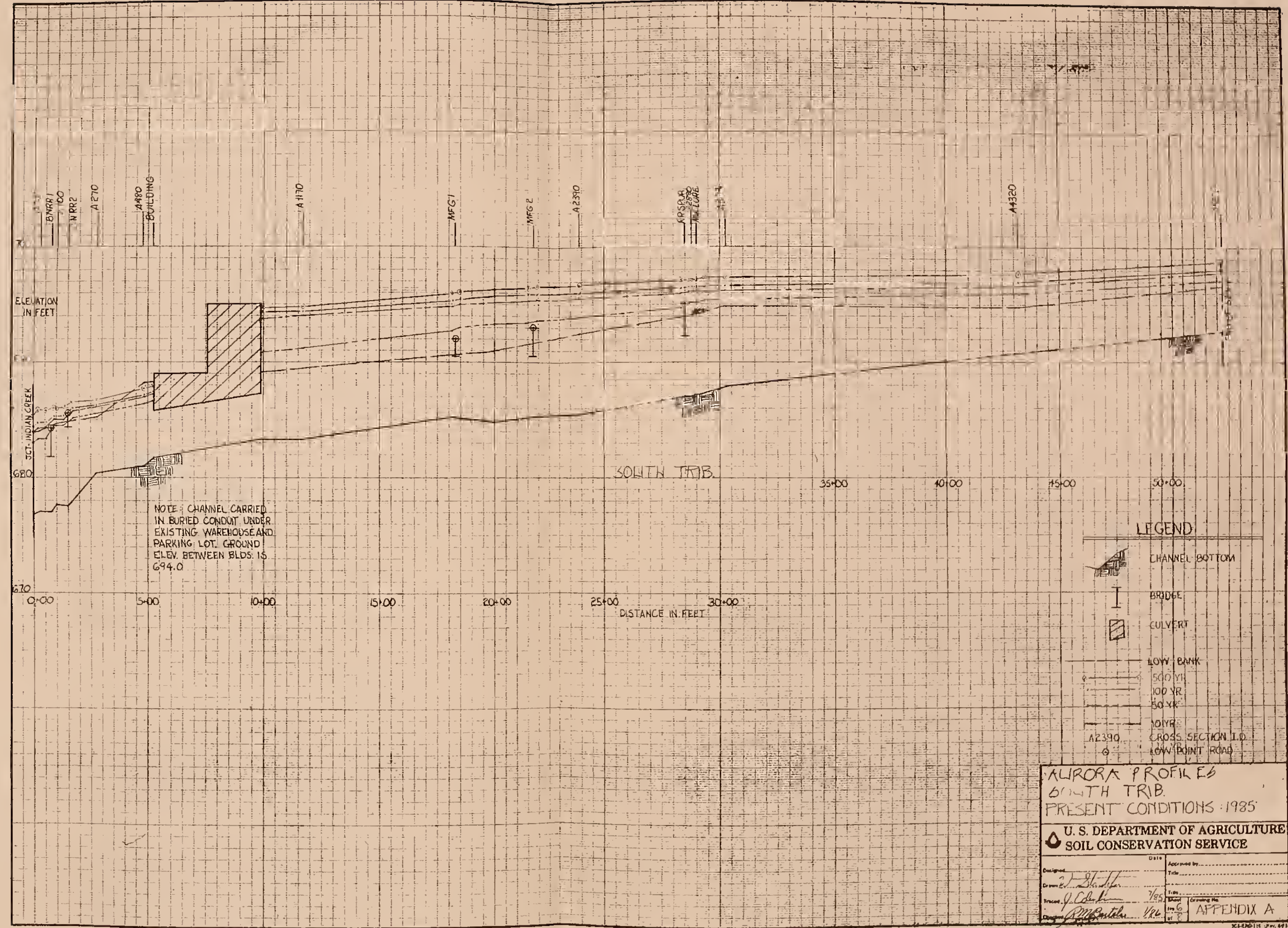
	Date	Approved by	
Designed		Title	
Drawn G. McFARLAN	6-85	Title	
Traced J. Edert	7/85	Sheet	Drawing No.
Checked R. McBaitel	1/86	2 of 3	APPENDIX A

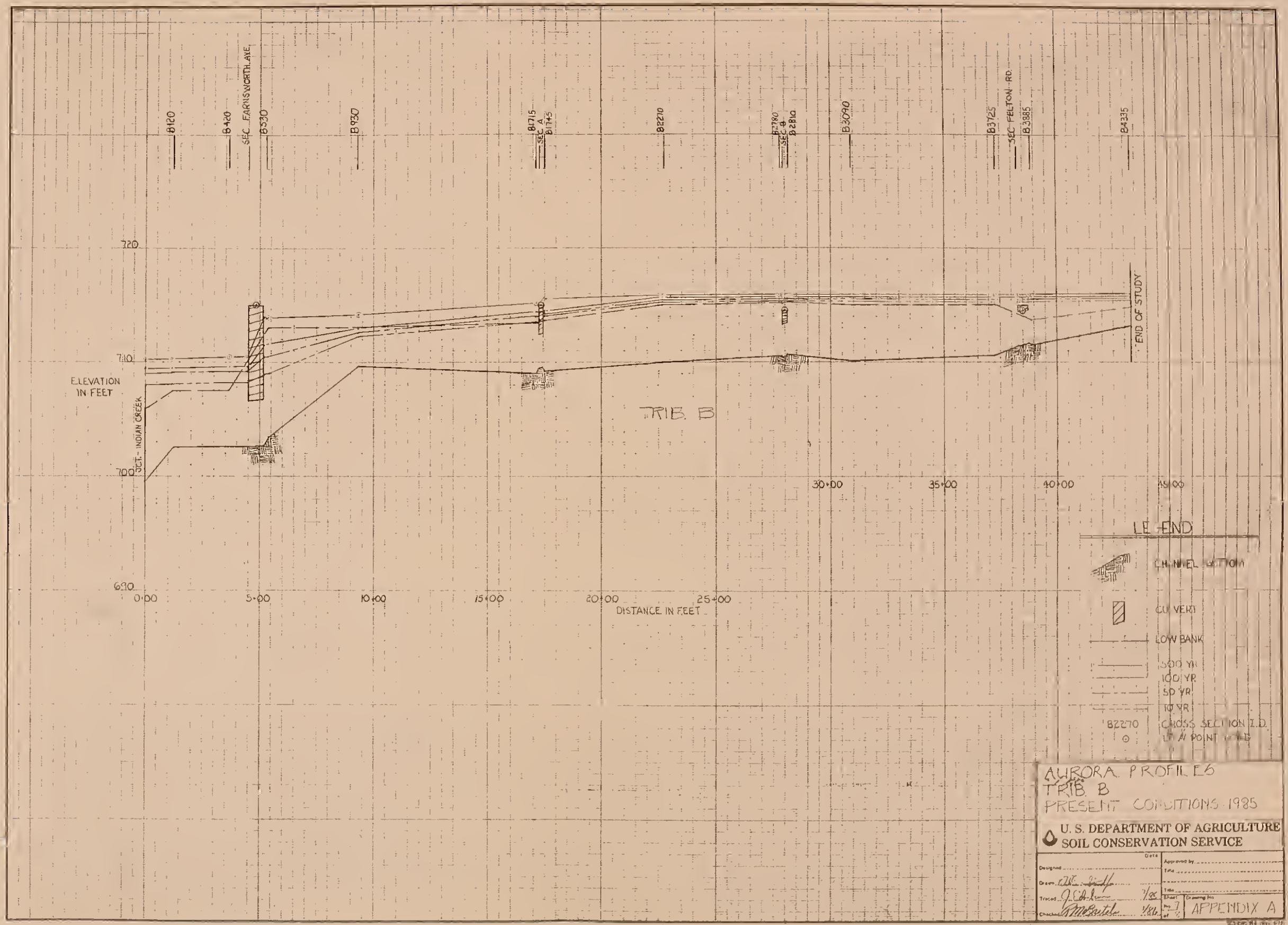

12640
13160
LANE
13390
13690
14085
FARNSWORTH
14320
14640
14880
15220
RECKINGER RD
15580
16185
JCT. TRIB B
16665
MARSHALL BLVD
16980
17290
710
700
690
ELEVATION IN FEET
MATCH SHEET 2
INDIAN CREEK
125+00
130+00
135+00
140+00
145+00
165+00
DISTANCE IN FEET
17290
17575
FARNSWORTH AVENUE
17820
18775
19365
20090
MOLITOR RD
20455
720
710
700
ELEVATION IN FEET
MATCH LINE 3B
MATCH SHEET 4
INDIAN CREEK
170+00
175+00
180+00
185+00
190+00
195+00
200+00
205+00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
BRIDGE
CULVERT
LOW BANK
500 YR
100 YR
50 YR
10 YR
15220 CROSS SECTION I.D.
LOW POINT ROAD
AURORA PROFILES
INDIAN CREEK
PRESENT CONDITIONS: 1985
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A



20465
20790
20850 JCT OF STELMARTEN CREEK
21520
22210
I-5 EAST-WEST TOLLWAY
22600
24410
720
ELEVATION 710
IN FEET
700
MATCH LINE 4-A
INDIAN CREEK
205+00
210+00
215+00
220+00
225+00
230+00
240+00
245+00
DISTANCE IN FEET
LEGEND
CHANNEL
LOW BANK
CULVERT
500 YR
24410
25590
BILTER ROAD
26020
27640
28340
ELEVATION
IN FEET
720
710
22600
LOW POINT
MATCH LINE 4-A
INDIAN CREEK
245+00
250+00
255+00
260+00
265+00
270+00
275+00
280+00
285+00
DISTANCE IN FEET
AURORA PROFILES
INDIAN CREEK
PRESENT CONDITIONS: 1985
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
GLENN McLERNON
J. Edelman 7/85
RMBartels 1/86
APPENDIX A


28540
29825
BUFFERFIELD
30240
318
33340
END OF STUDY
ELEVATION IN FEET
MATCH SHEET 4
720
285+00
290+00
295+00
300+00
305+00
310+00
315+00
320+00
325+00
330+00
INDIAN CREEK
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
LOW BANK
BRIDGE
500 YR
100 YR
50 YR
10 YR
CROSS SECTION ID
LOW POINT ROAD ID
AURORA PROFILES
INDIAN CREEK
PRESENT CONDITIONS 1985
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Date
Approved by
Title
Date
7/86
7/86
5
APPENDIX A

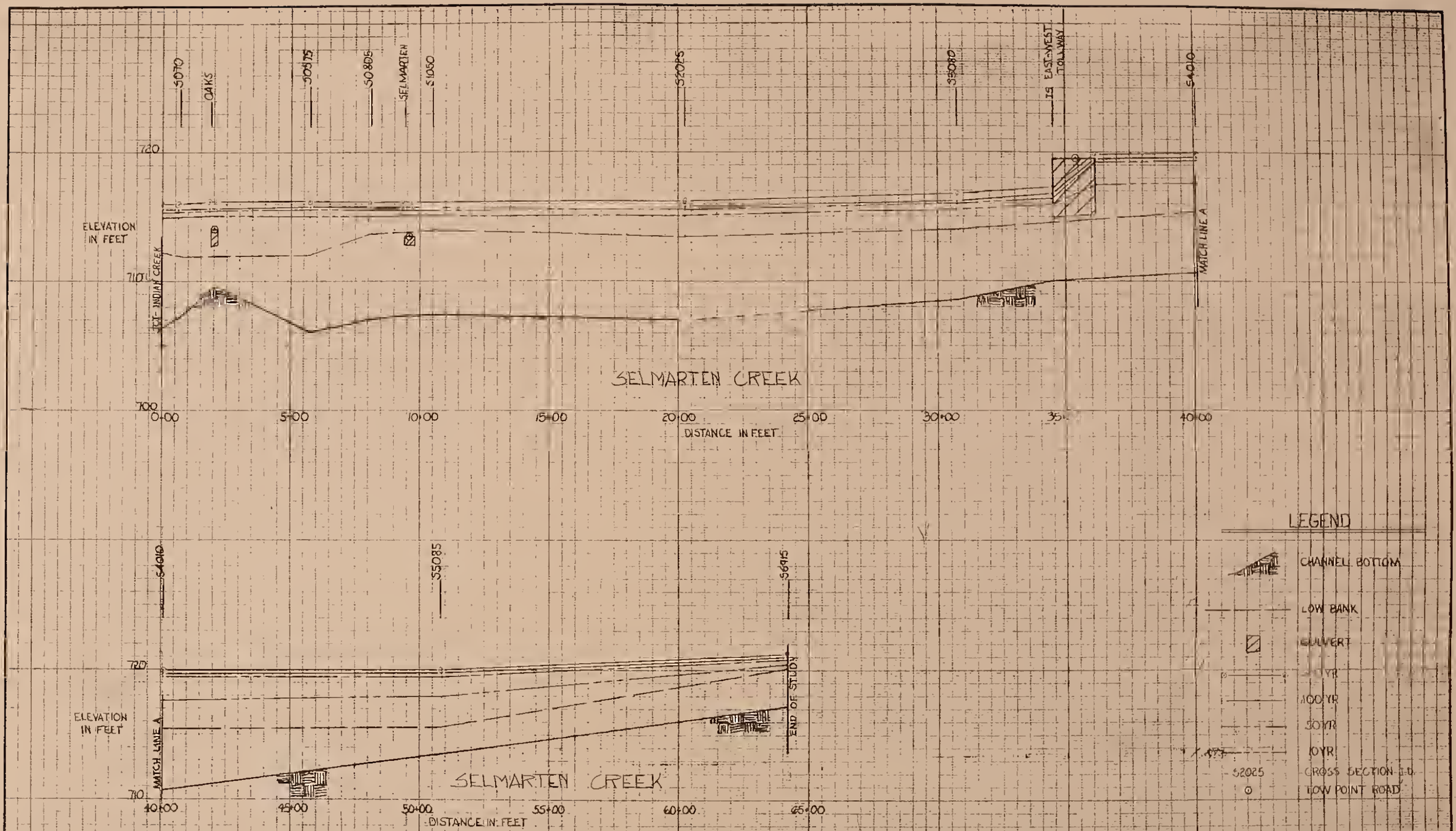

BNRR1
A100
NRR2
A270
A480
BUILDING
A1170
MFG1
MFG2
A2390
A4320
ELEVATION IN FEET
JCT. INDIAN CREEK
680
670
SOUTH TRIB.
NOTE: CHANNEL CARRIED IN BURIED CONDUIT UNDER EXISTING WAREHOUSE AND PARKING LOT. GROUND ELEV. BETWEEN BLDS. IS 694.0
0+00
5+00
10+00
15+00
20+00
25+00
30+00
35+00
40+00
45+00
50+00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
BRIDGE
CULVERT
LOW BANK
500 YR.
100 YR.
50 YR.
10 YR.
A2390 CROSS SECTION I.D.
LOW POINT ROAD
AURORA PROFILES
SOUTH TRIB.
PRESENT CONDITIONS 1985
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
7/85
1/86
APPENDIX A



AURORA PROFILES
TRIB. B
PRESENT CONDITIONS 1985

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Date	Approved by
Designed	Title
Drawn CDC Smith	Title
Traced J. Clark 1/86	Sheet No. 7 of 7
Checked [illegible] 1/86	APPENDIX A



AURORA PROFILES
SELMARTEN CREEK
PRESENT CONDITIONS: 1985

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed
Drawn W. Stanley
Traced J. Edenborn 7/85
Checked R.M. Bartels 7/86
Date
Approved by
Title
Date
Drawing No. APPENDIX A
Sheet No.
No.

NOTE: P. FILES IN THIS R. E. ASSUME THE FOX RIVER FLOODWATER ELEV. IS AT OR LESS THAN THE 5 YR. FREQ EVENT. THE AURORA F.I.S. SHOWS THE FOX RIVER 100 YR FLOODWATER ELEV. AT THE INDIAN CREEK JUNC. TO BE 635.5 AND THE 10 YR. FLOODWATER ELEV. TO BE 633.8

ELEVATION IN FEET

FOX RIVER 500 YR
FOX RIVER 100 YR
FOX RIVER 10 YR

INDIAN CREEK

LEGEND

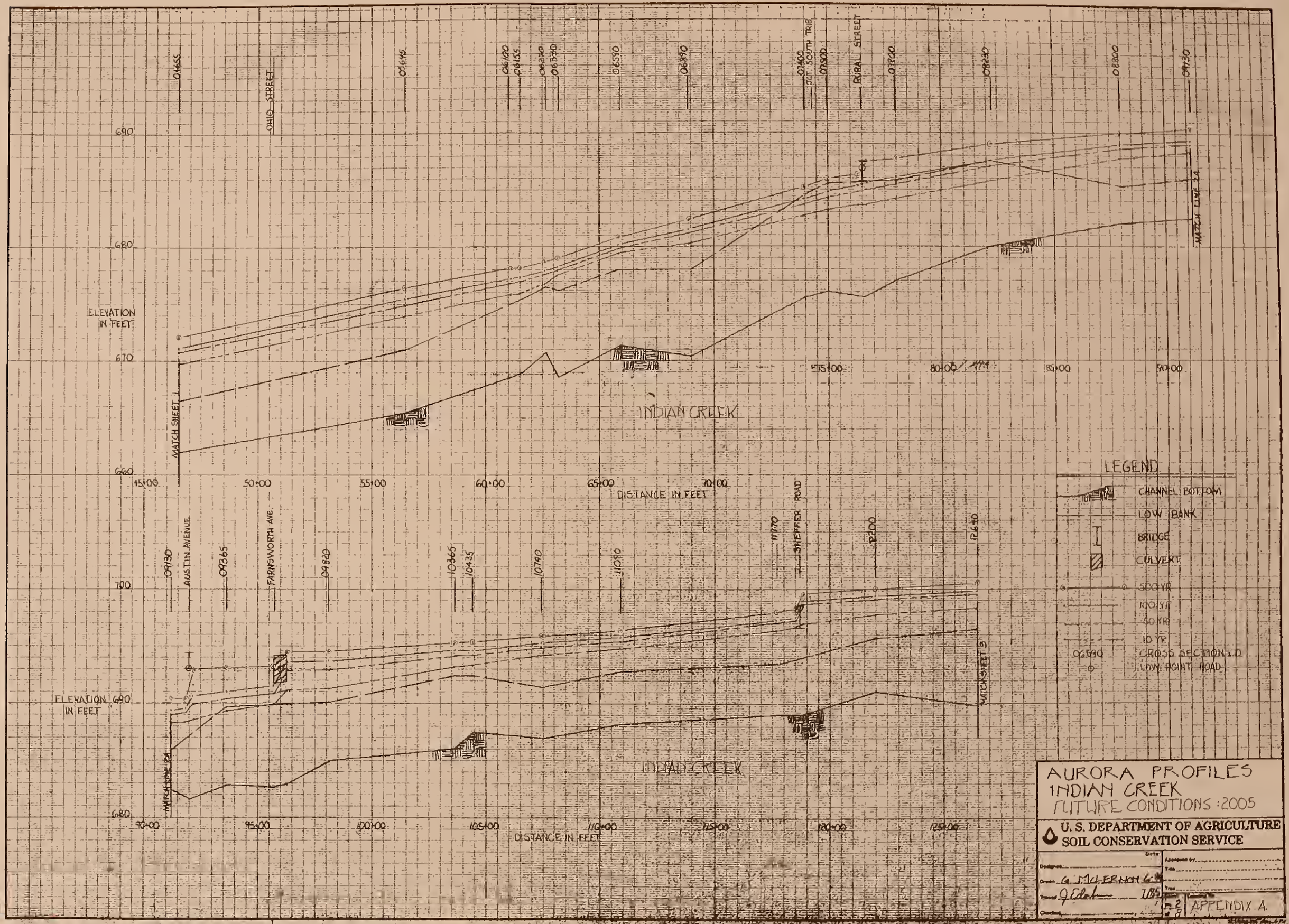
- CHANNEL BOTTOM
- BRIDGE
- CULVERT
- LOW BANK
- 500 YR
- 100 YR
- 50 YR
- 10 YR
- 03780 CROSS SECTION I.D.
- TO W. POINT ROAD

DISTANCE IN FEET

AURORA PROFILES
INDIAN CREEK
FUTURE CONDITIONS: 2005

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

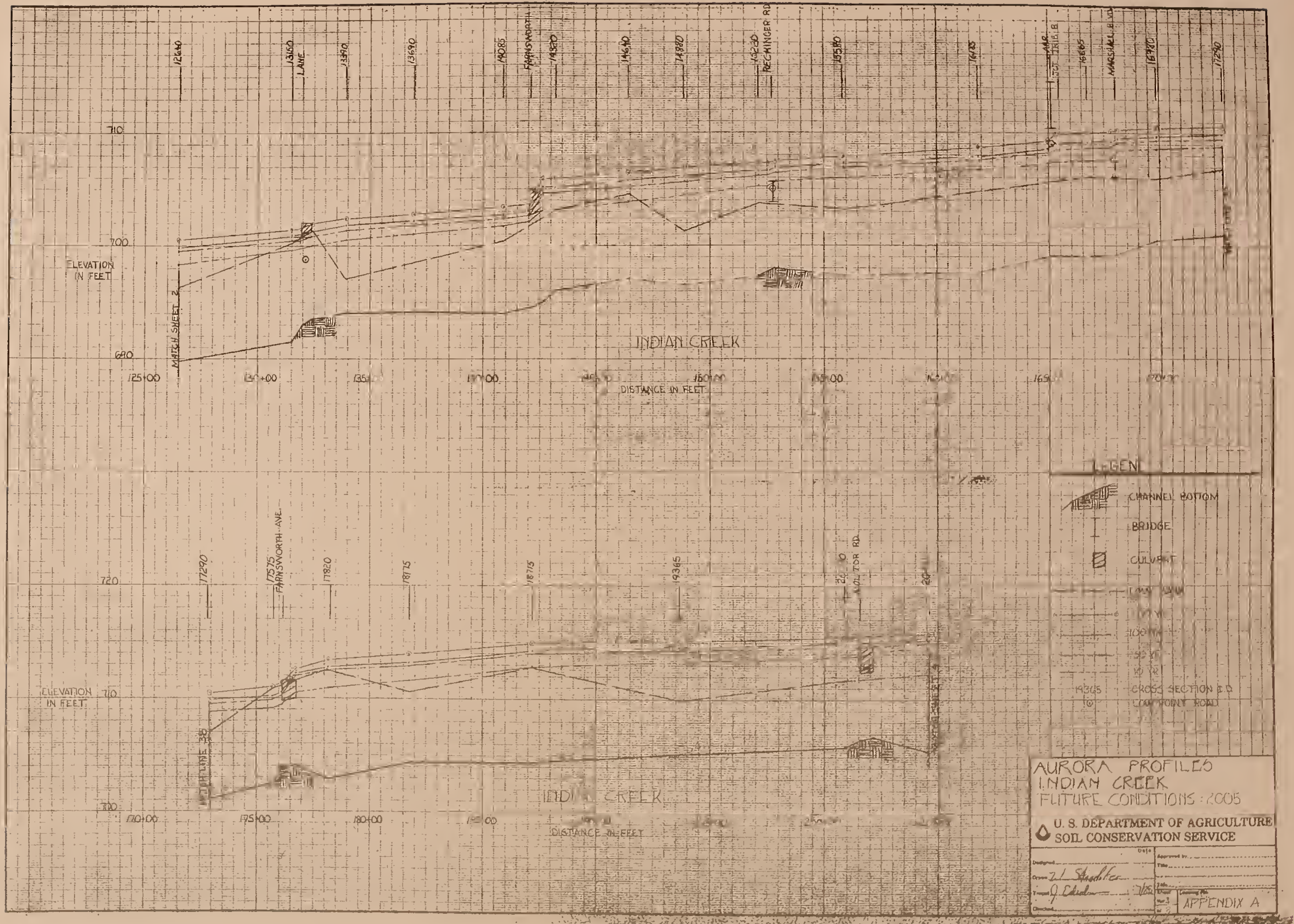
APPENDIX A



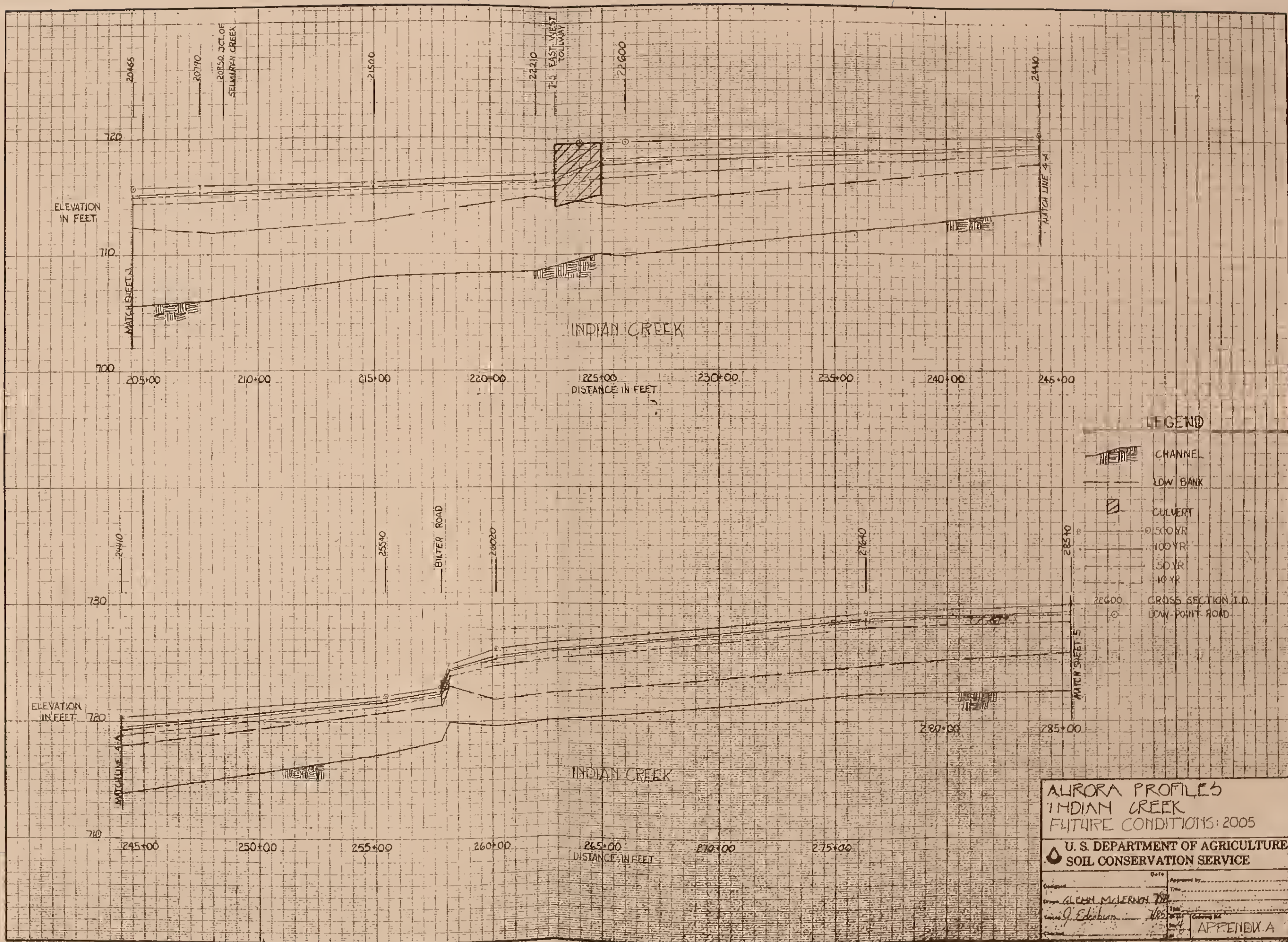
AURORA PROFILES
INDIAN CREEK
FUTURE CONDITIONS : 2005

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

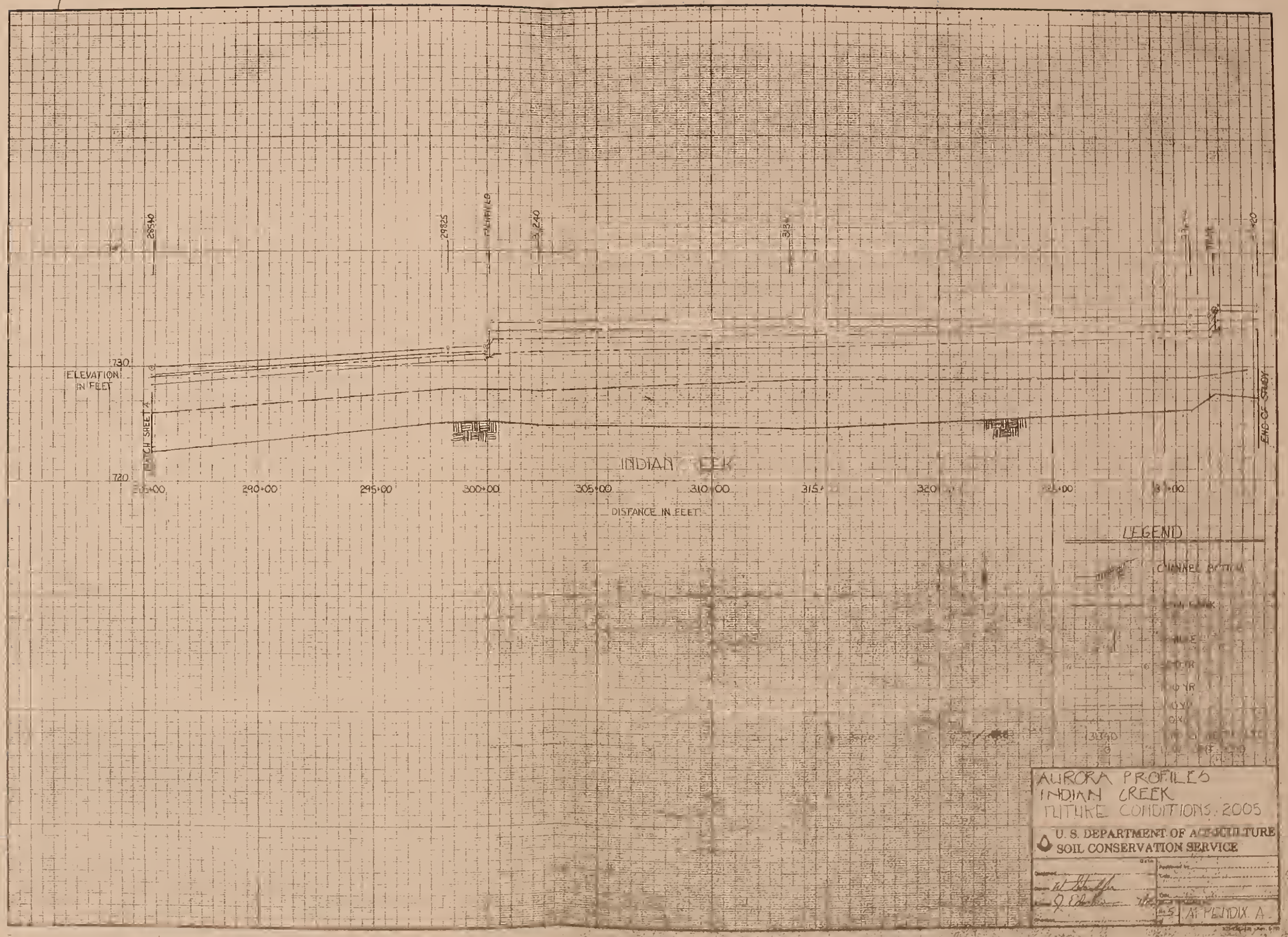
Designed	Date	Approved by	
G. MCFERRON	6-85	Title	
Q Clark	7-85	Year	
Checked		Drawing No.	APPENDIX A.

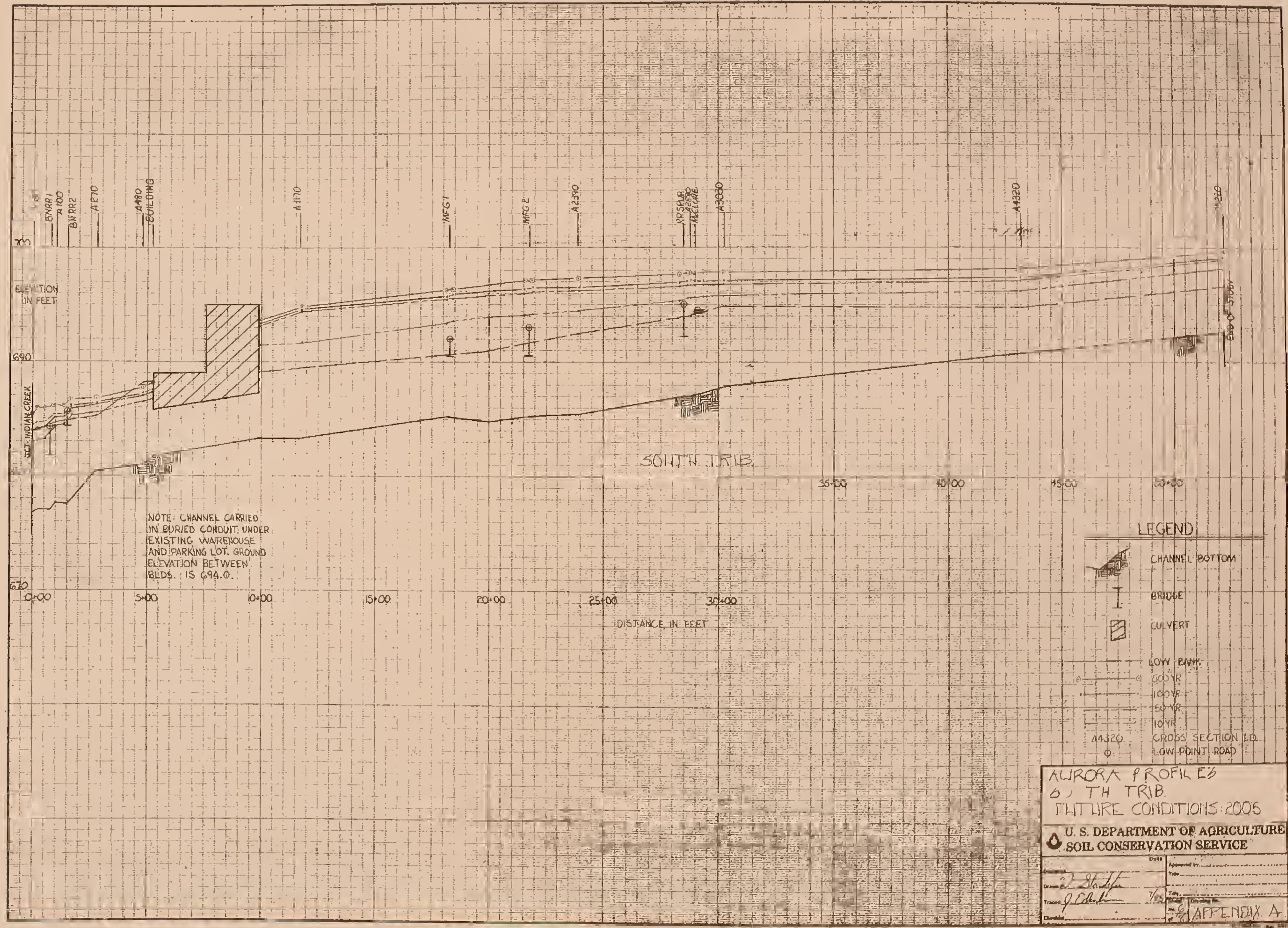


12640
13160
LANE
13390
13690
14085
FARNSWORTH
14320
14640
14880
15230
RECKINGER RD
15580
16175
TRIB B
16665
MARSHALL BLVD
16980
17290
710
700
680
ELEVATION IN FEET
MATCH SHEET 2
INDIAN CREEK
125+00
130+00
135+00
140+00
150+00
155+00
160+00
165+00
170+00
DISTANCE IN FEET
17290
17575 FARNSWORTH AVE.
17820
18715
19365
HOLZTOR RD.
720
710
700
ELEVATION IN FEET
MATCH LINE
INDIAN CREEK
170+00
175+00
180+00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
BRIDGE
CULVERT
CROSS SECTION I.D.
AURORA PROFILES
INDIAN CREEK
FUTURE CONDITIONS: 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A

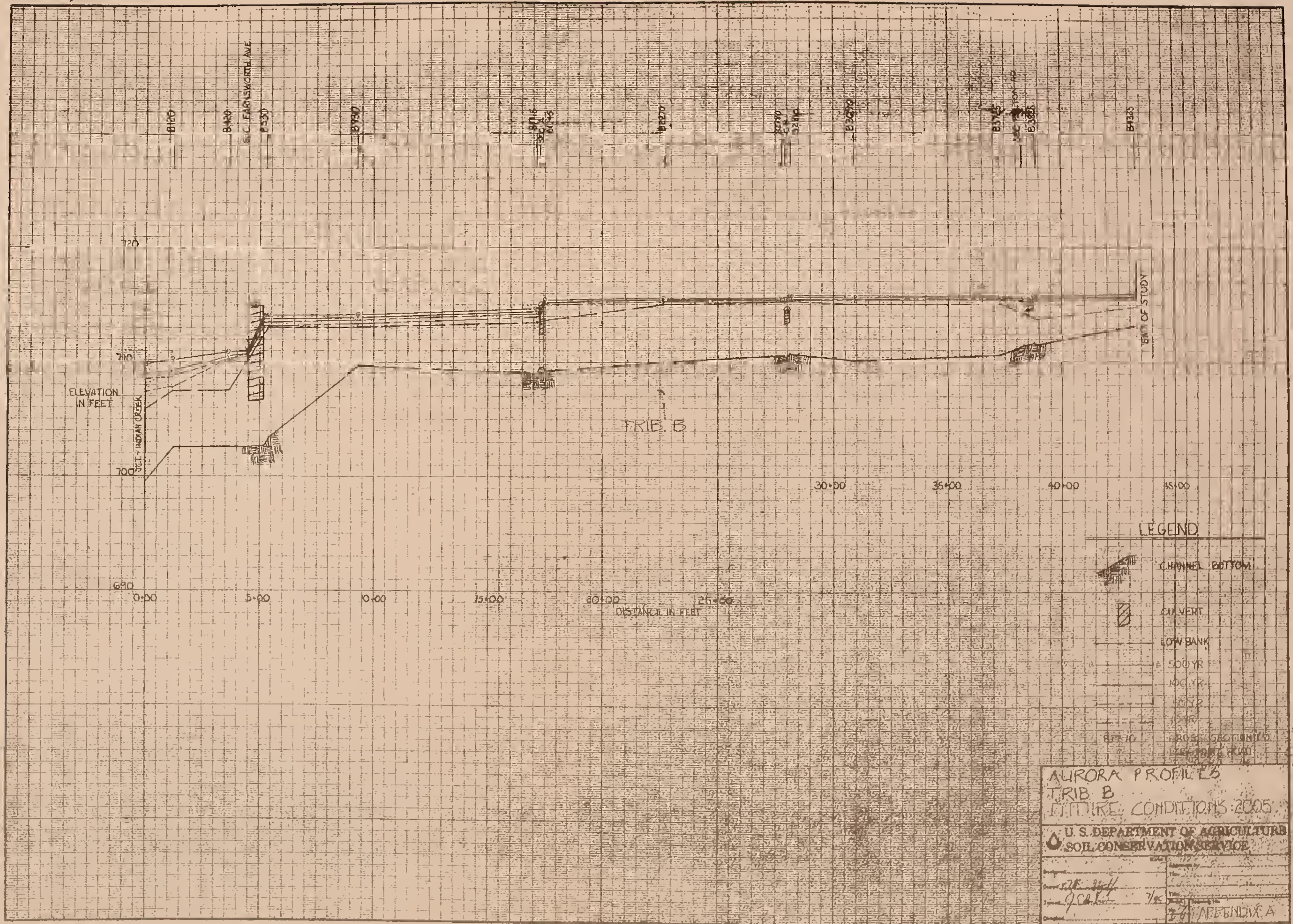


20465
20790
20850 JCT. OF STELMAREN CREEK
21500
23210
I-5 EAST-WEST TOLLWAY
22600
24410
720
ELEVATION IN FEET
710
700
MATCH SHEET 3
MATCH LINE 4-A
INDIAN CREEK
205+00
210+00
215+00
220+00
225+00
230+00
235+00
240+00
245+00
DISTANCE IN FEET
LEGEND
CHANNEL
LOW BANK
CULVERT
500 YR
100 YR
50 YR
10 YR
22600 CROSS SECTION I.D.
LOW-POINT ROAD
24410
25590
BILTER ROAD
26020
27640
28540
730
ELEVATION IN FEET
720
710
MATCHLINE 4-A
MATCH SHEET 5
INDIAN CREEK
245+00
250+00
255+00
260+00
265+00
270+00
275+00
280+00
285+00
DISTANCE IN FEET
AURORA PROFILES
INDIAN CREEK
FUTURE CONDITIONS: 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
GLENN McLERNON
APPENDIX A

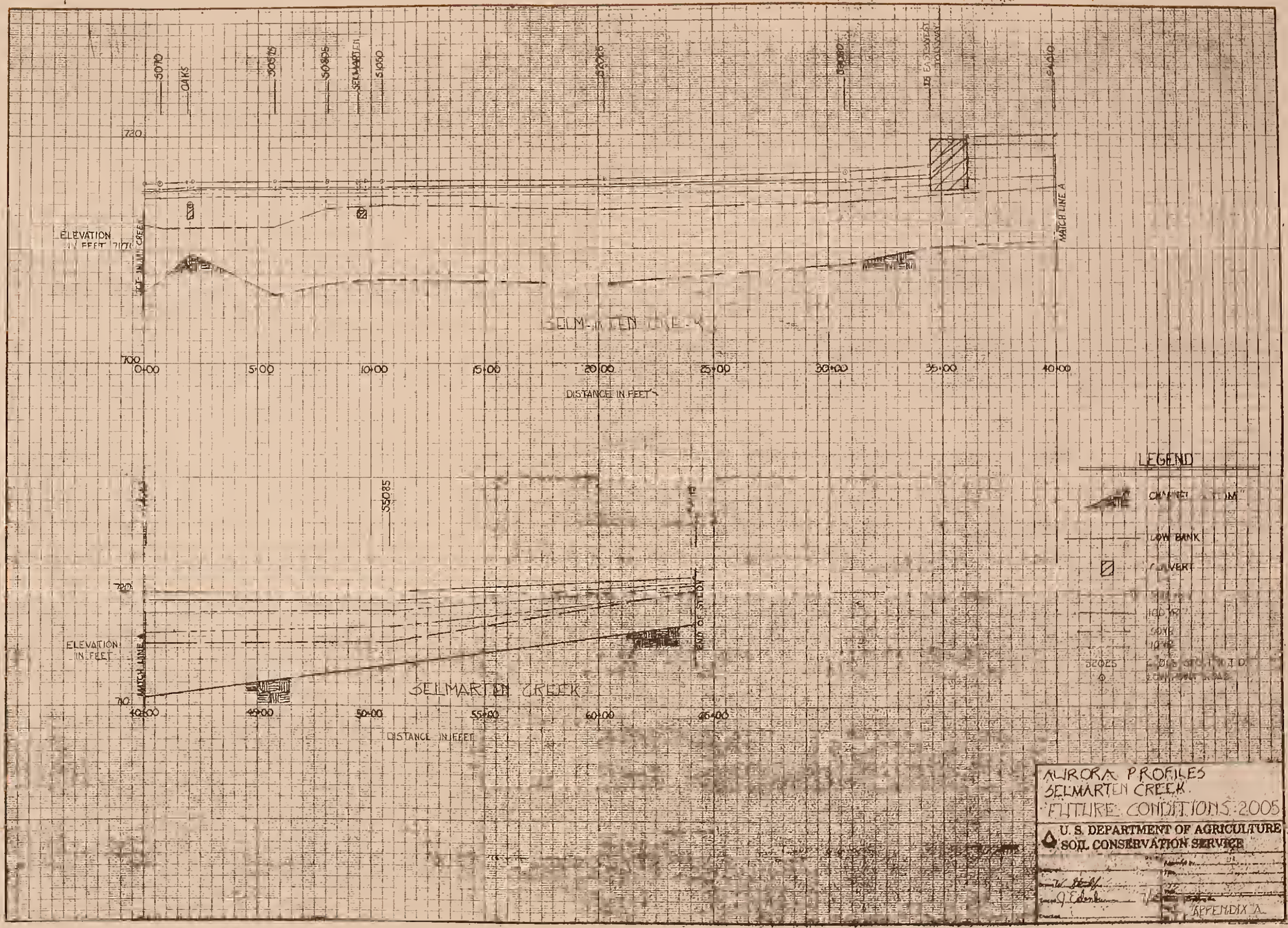

28540
29825
FILLMORE
31240
38
20
730
ELEVATION IN FEET
720
MATCH SHEET A
END OF STUDY
INDIAN CREEK
285+00
290+00
295+00
300+00
305+00
310+00
315+
320
+00
3 +00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
10 YR
50 YR
100 YR
500 YR
AURORA PROFILES
INDIAN CREEK
FUTURE CONDITIONS: 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A



BNRR1
A100
BNRR2
A270
A480
BUILDING
A1170
MFG1
MFG2
A2390
RRSPUR
MCCLURE
A3030
A4320
END OF STUDY
700
690
670
ELEVATION IN FEET
JCT. INDIAN CREEK
SOUTH TRIB.
0+00
5+00
10+00
15+00
20+00
25+00
30+00
35+00
40+00
45+00
50+00
DISTANCE IN FEET
NOTE: CHANNEL CARRIED IN BURIED CONDUIT UNDER EXISTING WAREHOUSE AND PARKING LOT. GROUND ELEVATION BETWEEN BLDS. IS 694.0.
LEGEND
CHANNEL BOTTOM
BRIDGE
CULVERT
LOW BANK
500 YR.
100 YR.
50 YR.
10 YR.
A4320 CROSS SECTION I.D.
LOW POINT ROAD
AURORA PROFILES
SOUTH TRIB.
FUTURE CONDITIONS: 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Date
Approved by
Title
Drawn
Traced
Checked
APPENDIX A



B120
B420
B.C. FARNSWORTH AVE
B530
B930
B1716
B1770
B2790
B3240
B3320
B4325
720
710
700
690
ELEVATION IN FEET
JCT. + INDIAN CREEK
TRIB. B
END OF STUDY
0+00
5+00
10+00
15+00
20+00
25+00
30+00
35+00
40+00
45+00
DISTANCE IN FEET
LEGEND
CHANNEL BOTTOM
CULVERT
LOW BANK
500 YR
100 YR
AURORA PROFILES
TRIB. B
FUTURE CONDITIONS 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A


SELMARTEN CREEK
ELEVATION IN FEET
DISTANCE IN FEET
MATCH LINE A
END OF STUDY
LEGEND
LOW BANK
CULVERT
AURORA PROFILES
SELMARTEN CREEK
FUTURE CONDITIONS: 2005
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX A

SECTION 20455

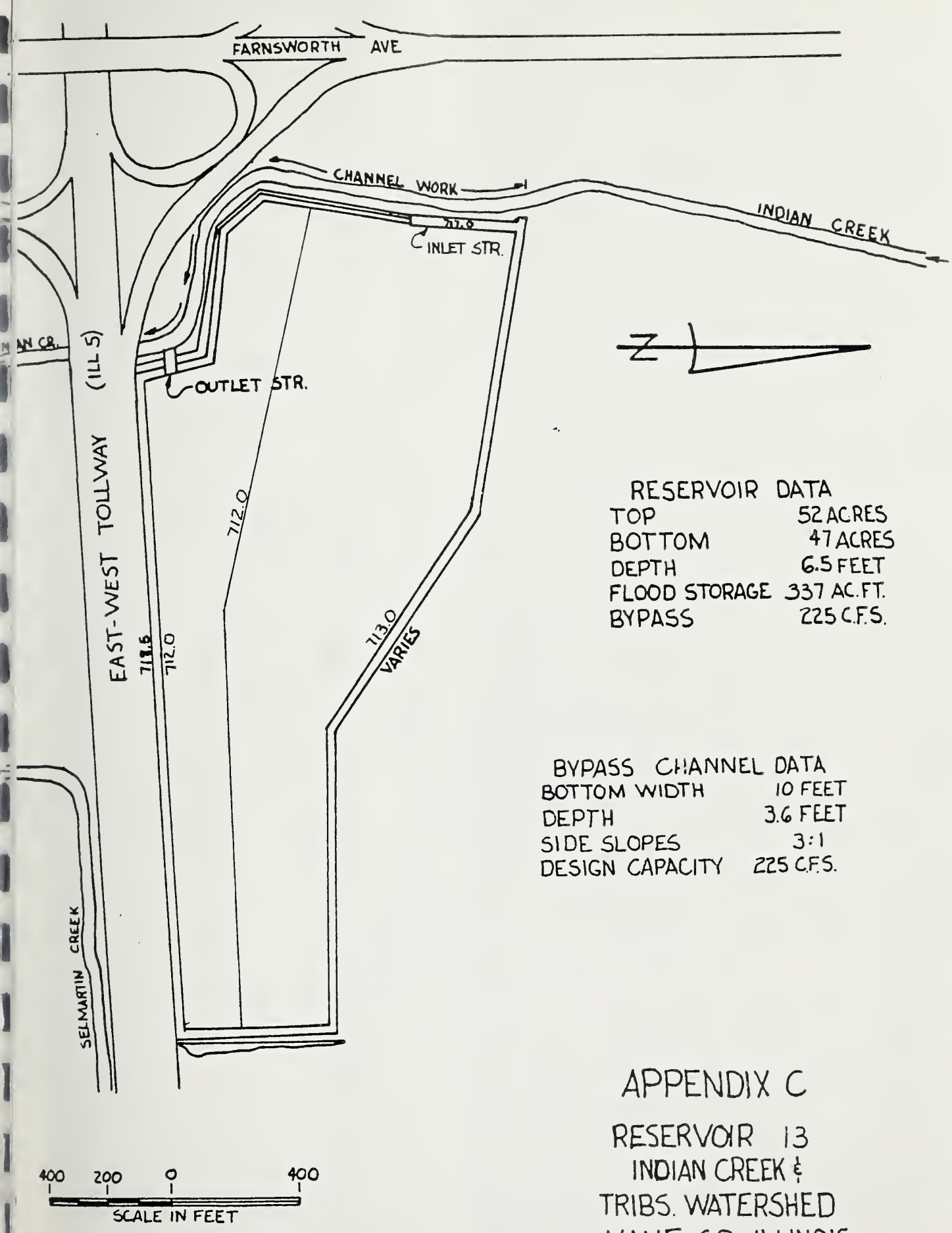
SECTION 26020

TYPICAL CROSS SECTION
INDIAN CREEK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed
Drawn J. Edenfield 9/85
Traced
Checked
Date
Approved by
Title
Title
Sheet No. 1 of 1
Drawing No. APPENDIX B

SCS-ENG-316 (Rev. 6-75)



RESERVOIR DATA

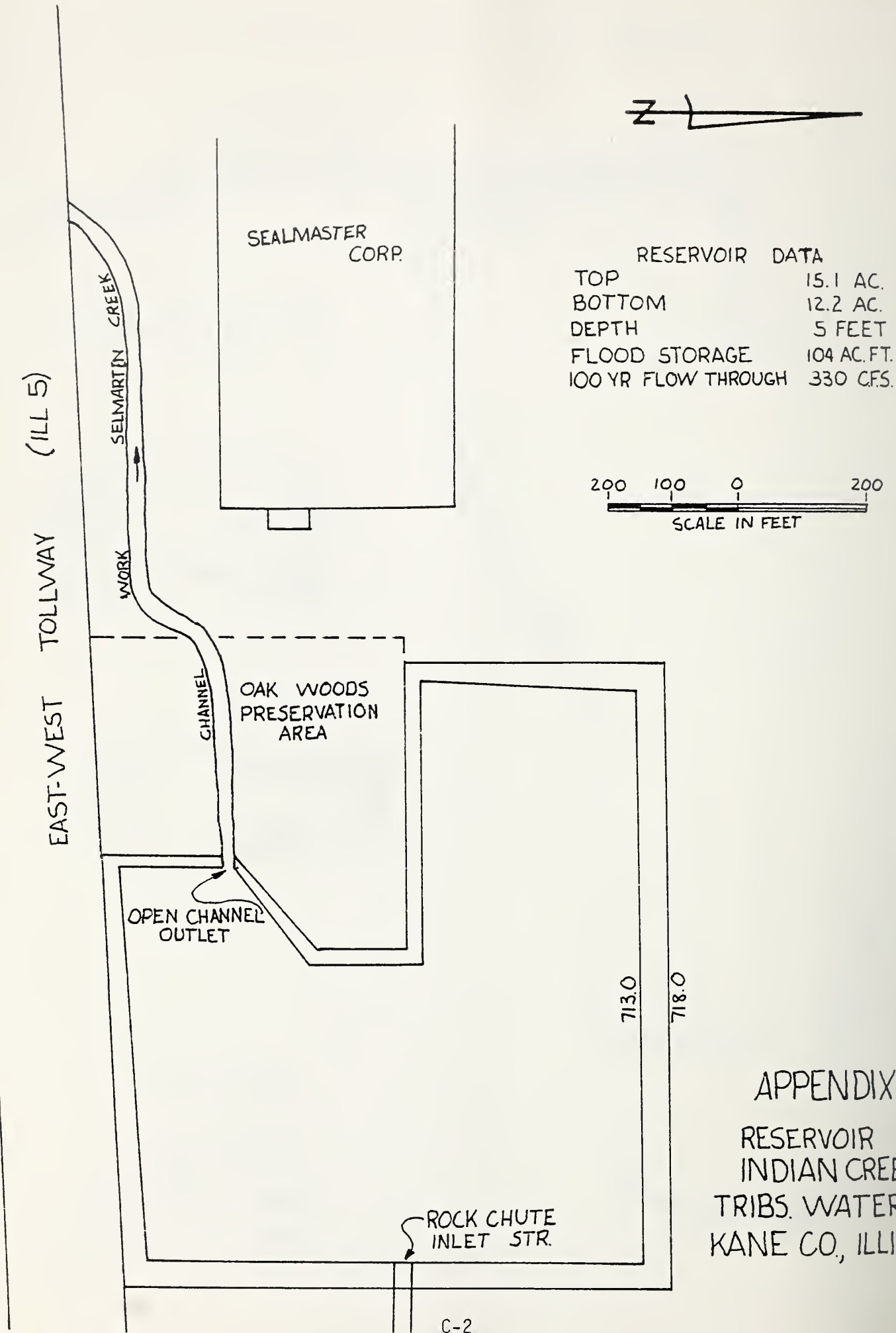
TOP	52 ACRES
BOTTOM	47 ACRES
DEPTH	6.5 FEET
FLOOD STORAGE	337 AC. FT.
BYPASS	225 C.F.S.

BYPASS CHANNEL DATA

BOTTOM WIDTH	10 FEET
DEPTH	3.6 FEET
SIDE SLOPES	3:1
DESIGN CAPACITY	225 C.F.S.

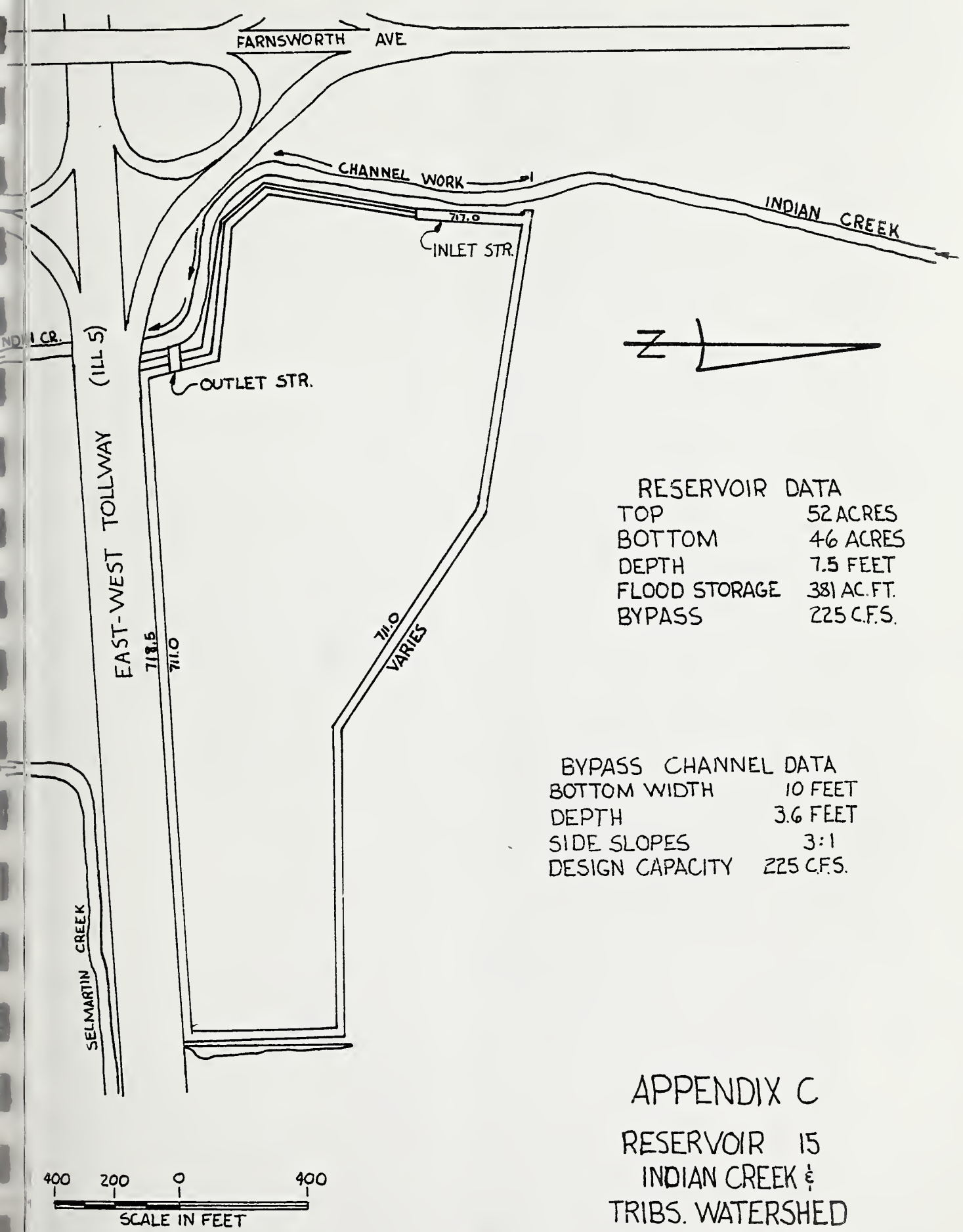
APPENDIX C

RESERVOIR 13
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



APPENDIX C

RESERVOIR 14
INDIAN CREEK &
TRIBS. WATERSH
KANE CO., ILLINO



RESERVOIR DATA

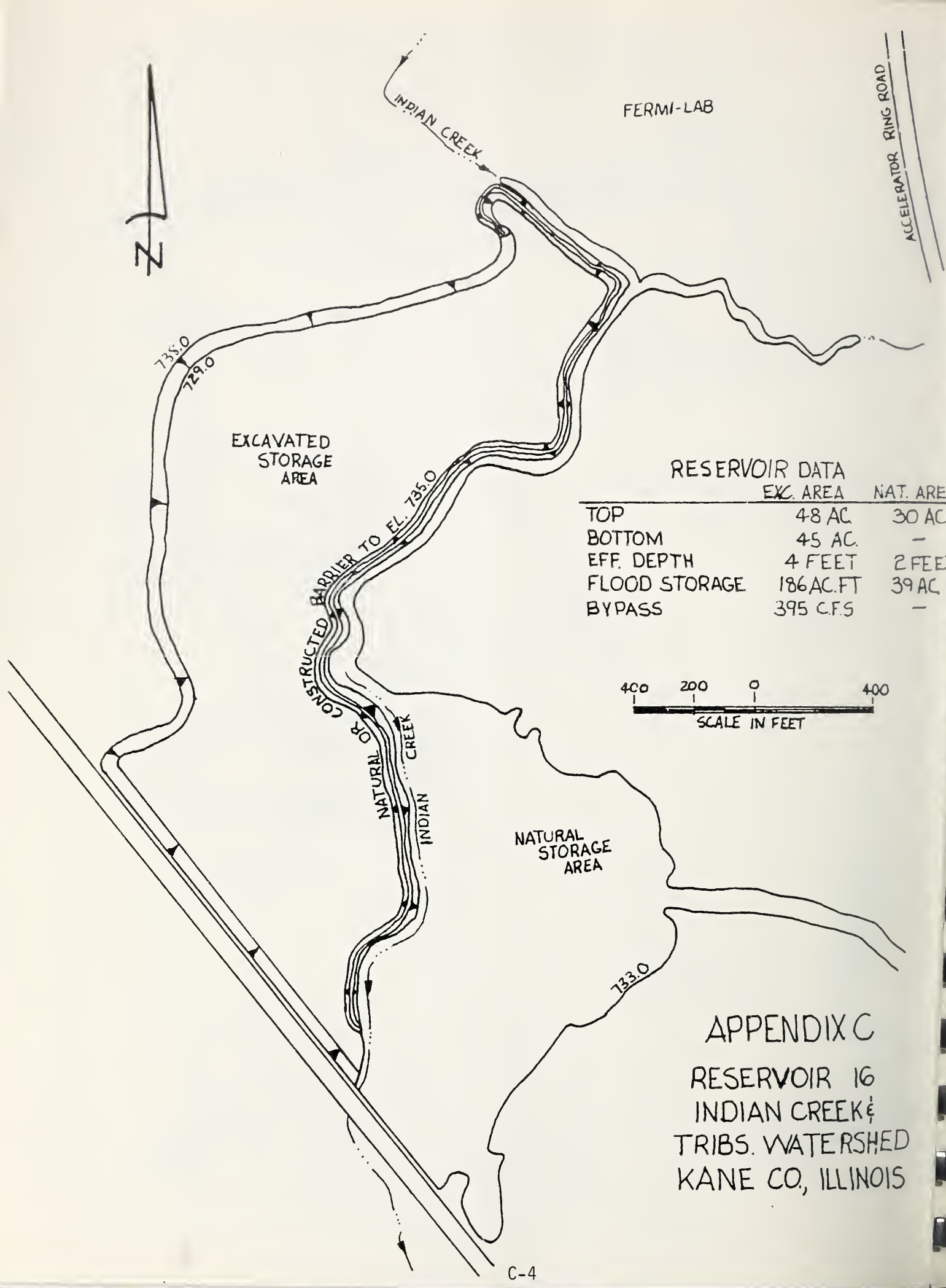
TOP	52 ACRES
BOTTOM	46 ACRES
DEPTH	7.5 FEET
FLOOD STORAGE	381 AC. FT.
BYPASS	225 C.F.S.

BYPASS CHANNEL DATA

BOTTOM WIDTH	10 FEET
DEPTH	3.6 FEET
SIDE SLOPES	3:1
DESIGN CAPACITY	225 C.F.S.

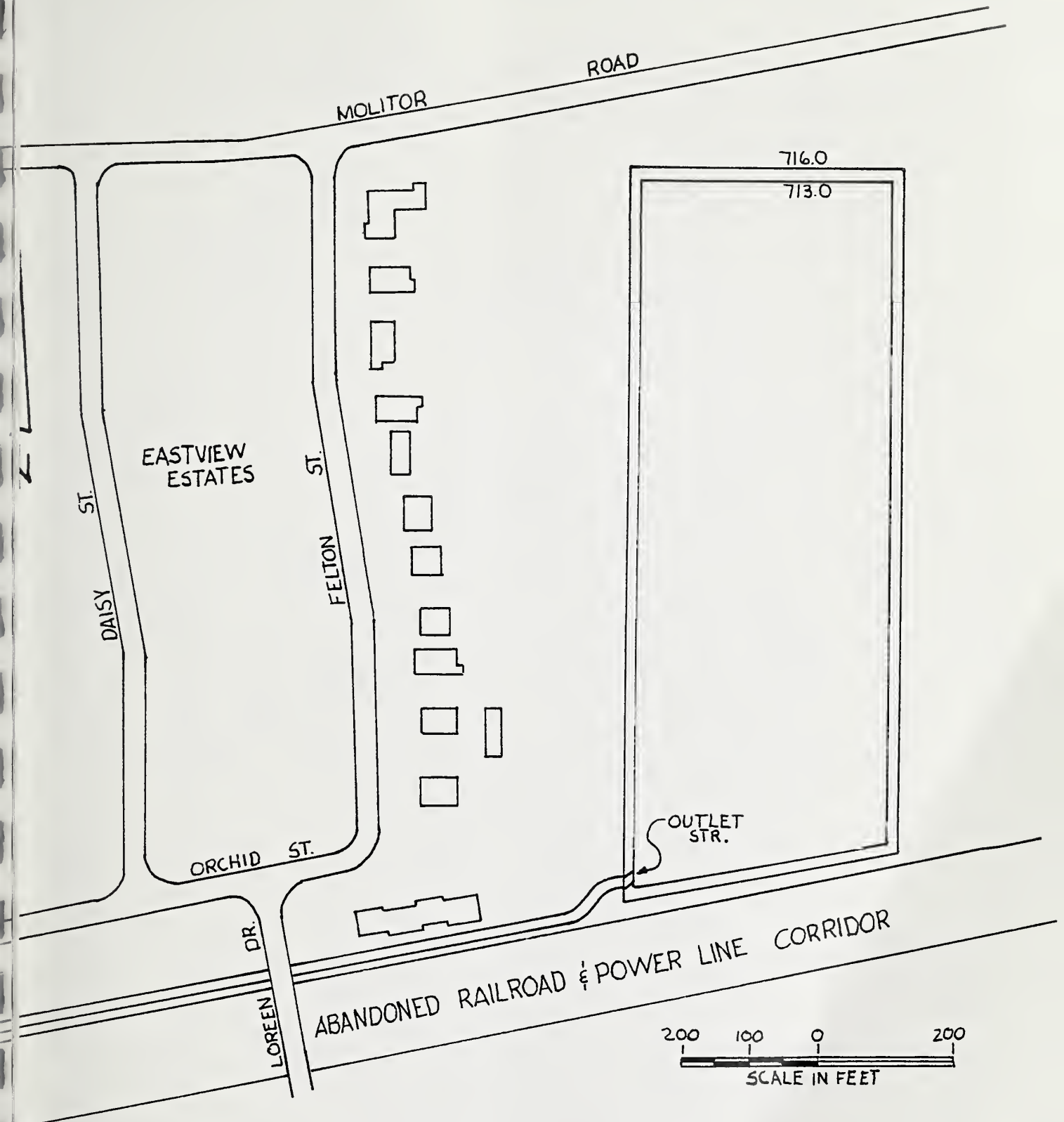
APPENDIX C

RESERVOIR 15
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



APPENDIX C

RESERVOIR 16
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS

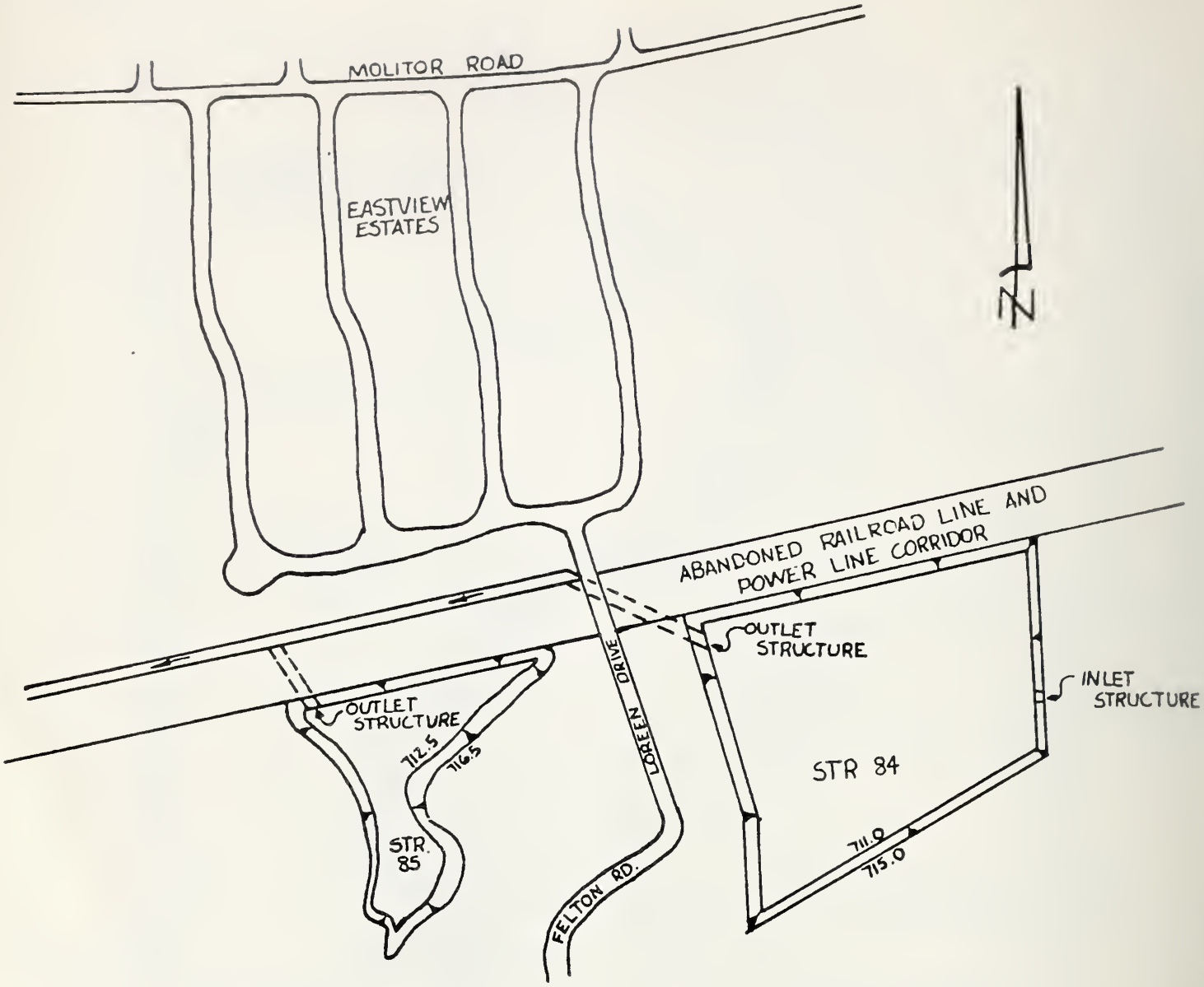


RESERVOIR DATA

TOP	9.5 ACRES
BOTTOM	8.6 ACRES
DEPTH	3 FEET
FLOOD STORAGE	27 AC. FT.
100YR FLOW THROUGH	39 C.F.S.

APPENDIX C

RESERVOIR 41
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



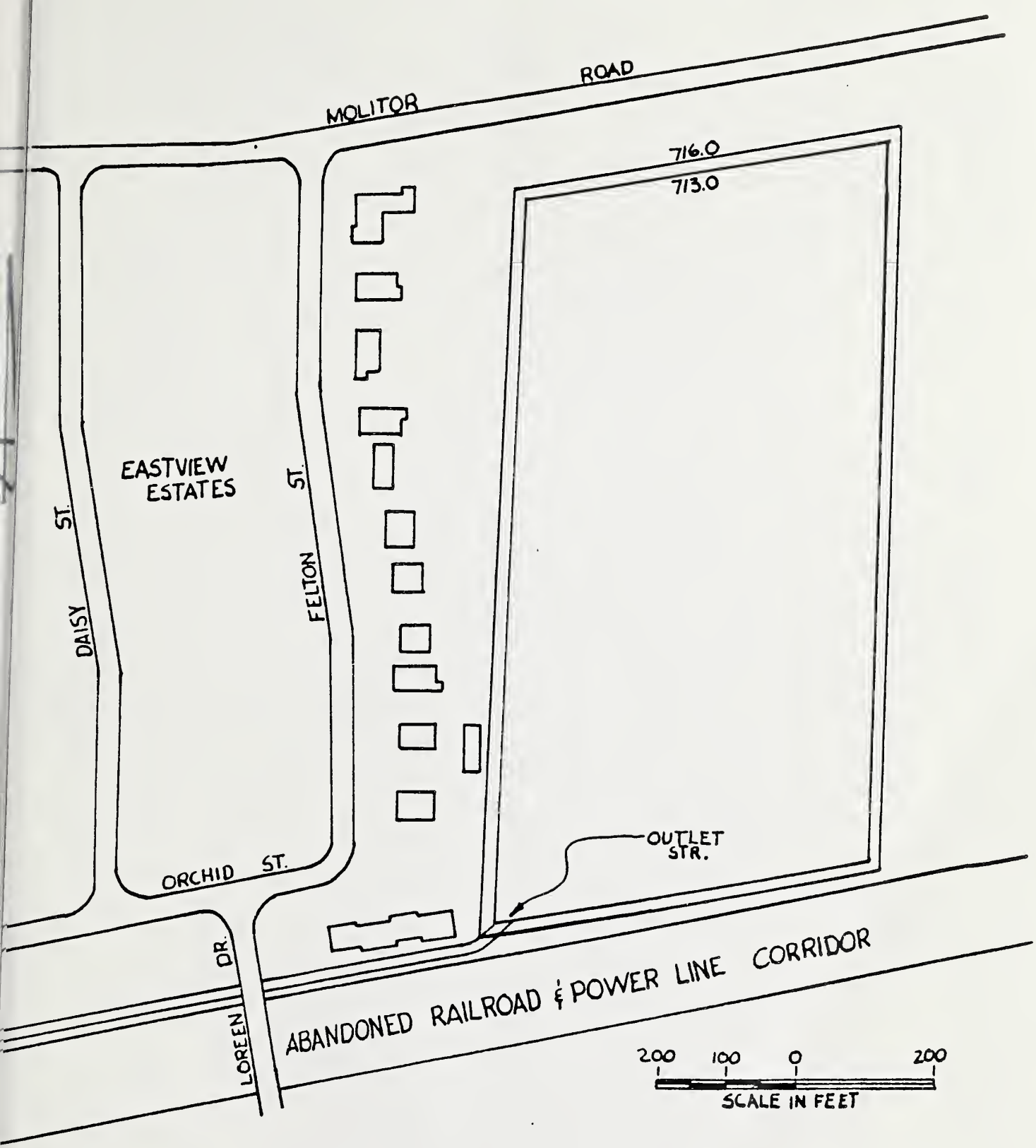
RESERVOIR 85 DATA
TOP 4.0 ACRES
BOTTOM 3.0 ACRES
DEPTH 4.0 FEET
FLOOD STORAGE 13 AC. FT.
100 YR. FLOW THROUGH
45 C.F.S.

RESERVOIR 84 DATA
TOP 12.4 ACRES
BOTTOM 10.5 ACRES
DEPTH 4.0 FEET
FLOOD STORAGE 46 AC. FT.
100 YR FLOW THROUGH
49 C.F.S.

400 200 0 400
SCALE IN FEET

APPENDIX C

RESERVOIR 84 & 85
INDIAN CREEK & TRIBS. WATERSHED
KANE CO, ILLINOIS

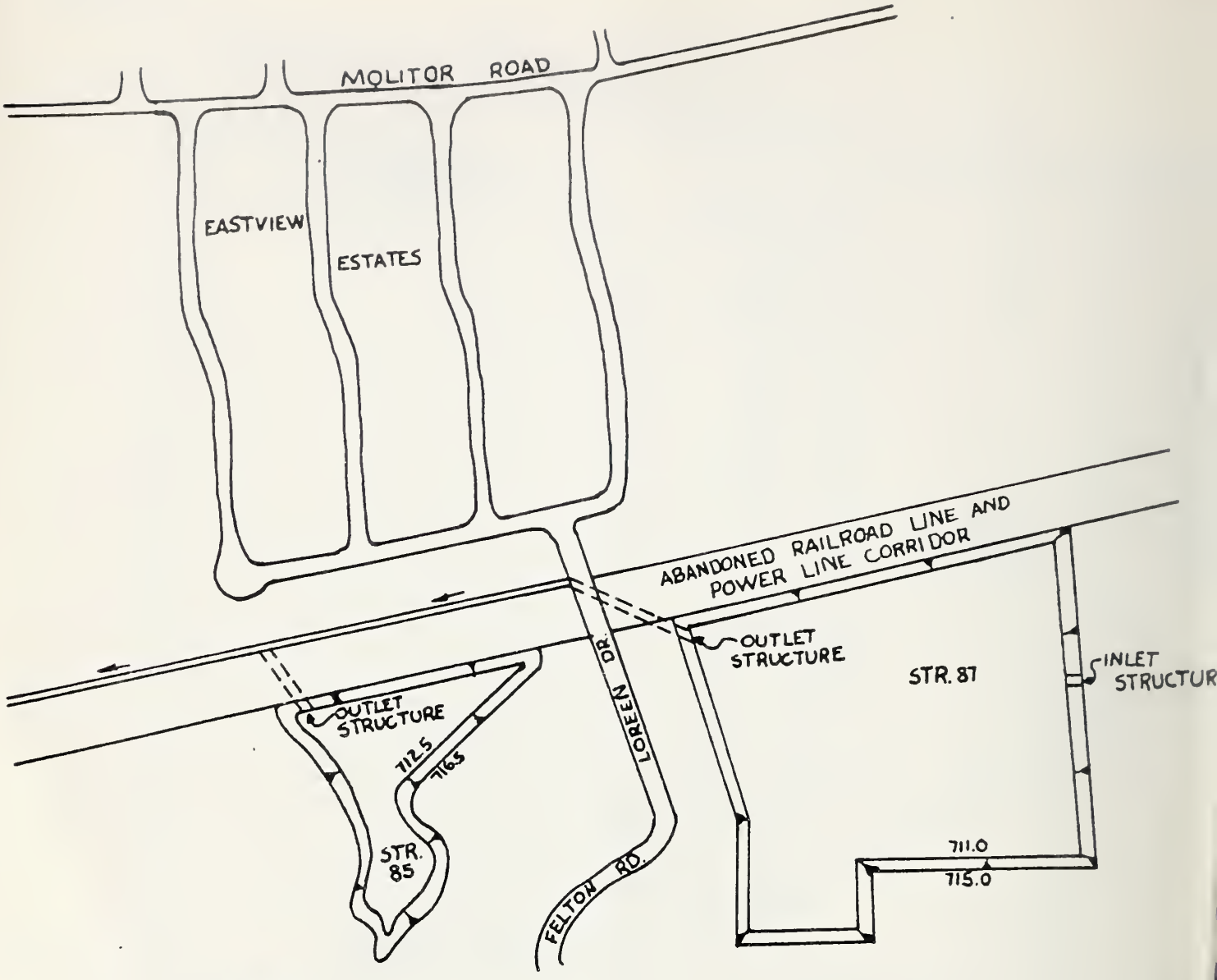


RESERVOIR DATA

TOP	13.6 ACRES
BOTTOM	12.6 ACRES
DEPTH	3 FEET
FLOOD STORAGE	32 AC. FT.
100YR FLOW THROUGH	12 C.F.S.

APPENDIX C

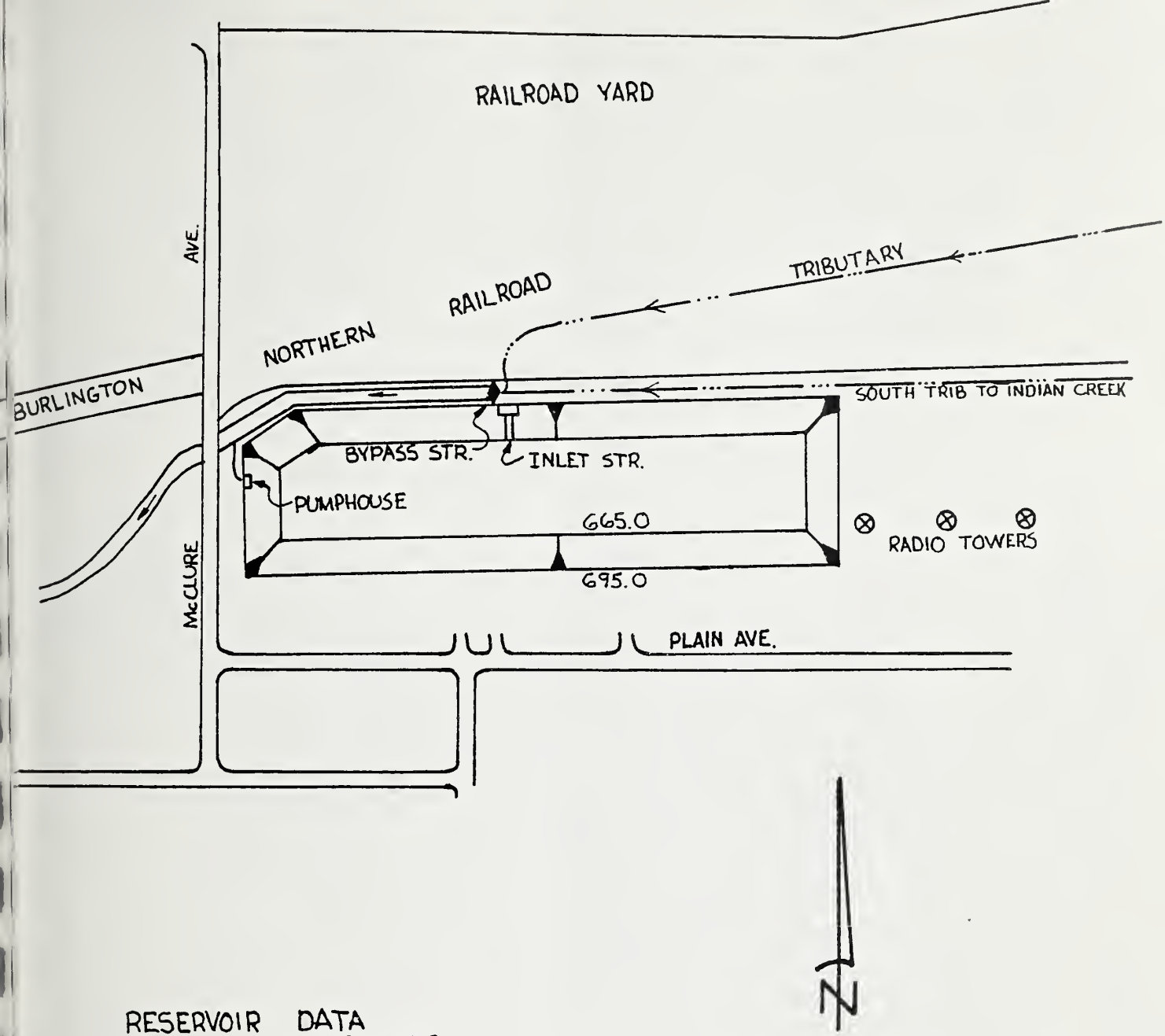
RESERVOIR 86
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



RESERVOIR 87 DATA

TOP	17.5 ACRES
BOTTOM	15.5 ACRES
DEPTH	4.0 FEET
FLOOD STORAGE	56 AC. FT
100 YR FLOW THROUGH	33 C.F.S.

APPENDIX C
RESERVOIR 87
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



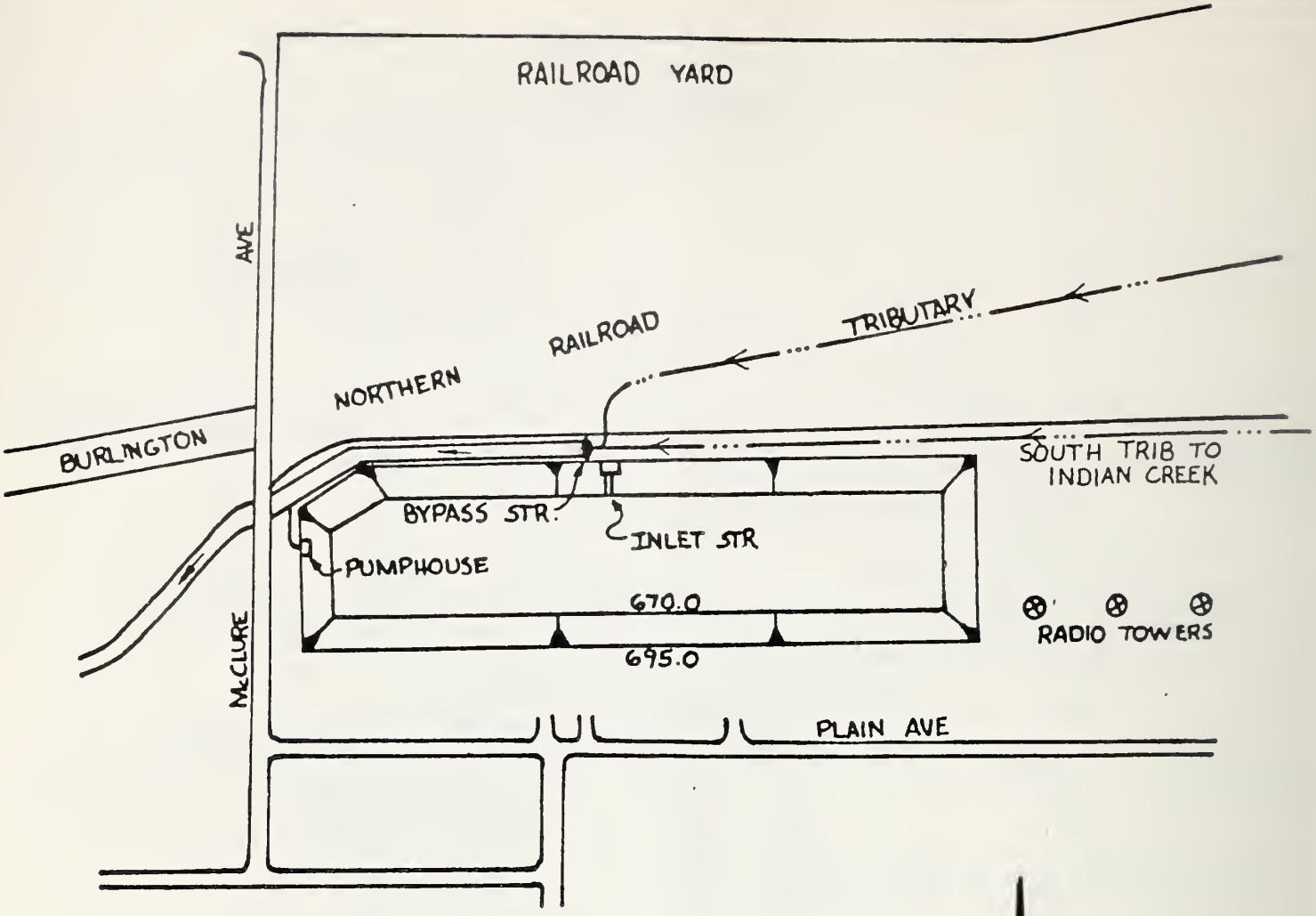
RESERVOIR DATA	
TOP	13.2 ACRES
BOTTOM	5.6 ACRES
DEPTH	30 FEET
FLOOD STORAGE	275 AC.FT.
BYPASS	125 C.F.S.

400 200 0 400

SCALE IN FEET

APPENDIX C

McCLURE RESERVOIR (A)
INDIAN CREEK & TRIBS WATERSHED
KANE CO., ILLINOIS



RESERVOIR DATA

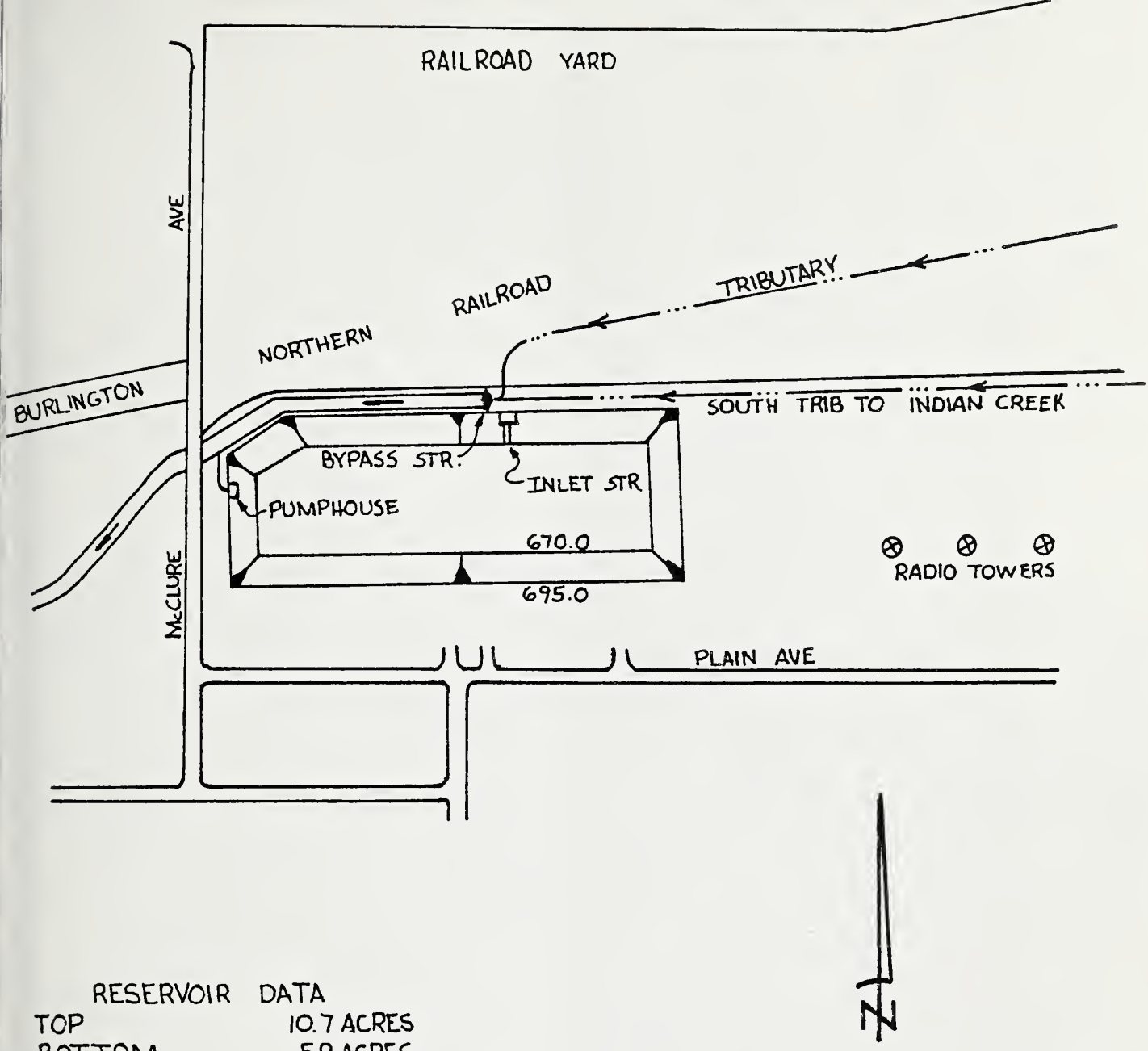
TOP	13.2 ACRES
BOTTOM	7.4 ACRES
DEPTH	25 FEET
FLOOD STORAGE	250 AC.FT.
BYPASS	150 C.F.S.

400 200 0 400

SCALE IN FEET

APPENDIX C

McCLURE RESERVOIR (B)
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS



RESERVOIR DATA

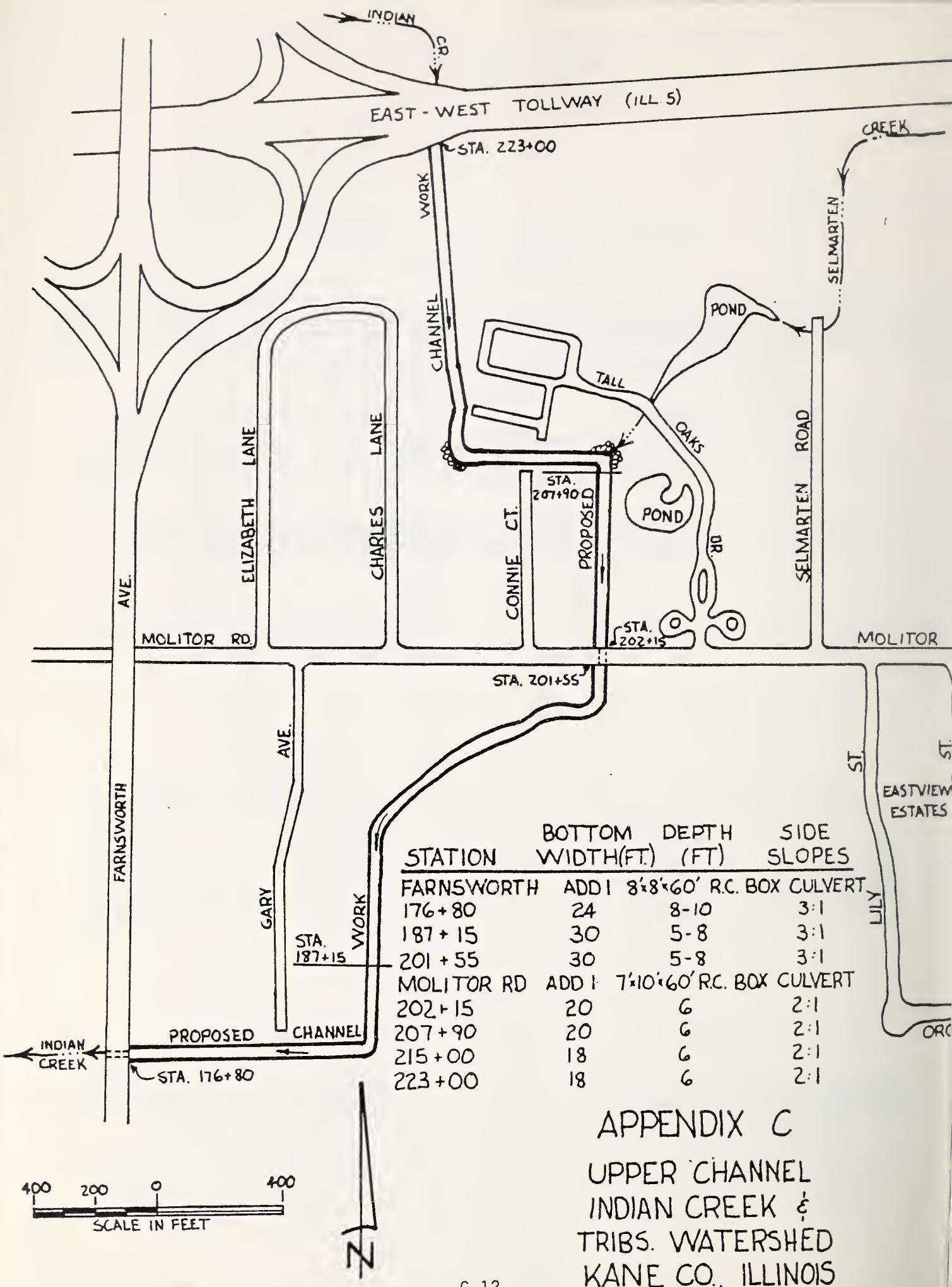
TOP	10.7 ACRES
BOTTOM	5.9 ACRES
DEPTH	25 FEET
FLOOD STORAGE	200 AC.FT.
BYPASS	200 C.F.S.

400 200 0 400

SCALE IN FEET

APPENDIX C

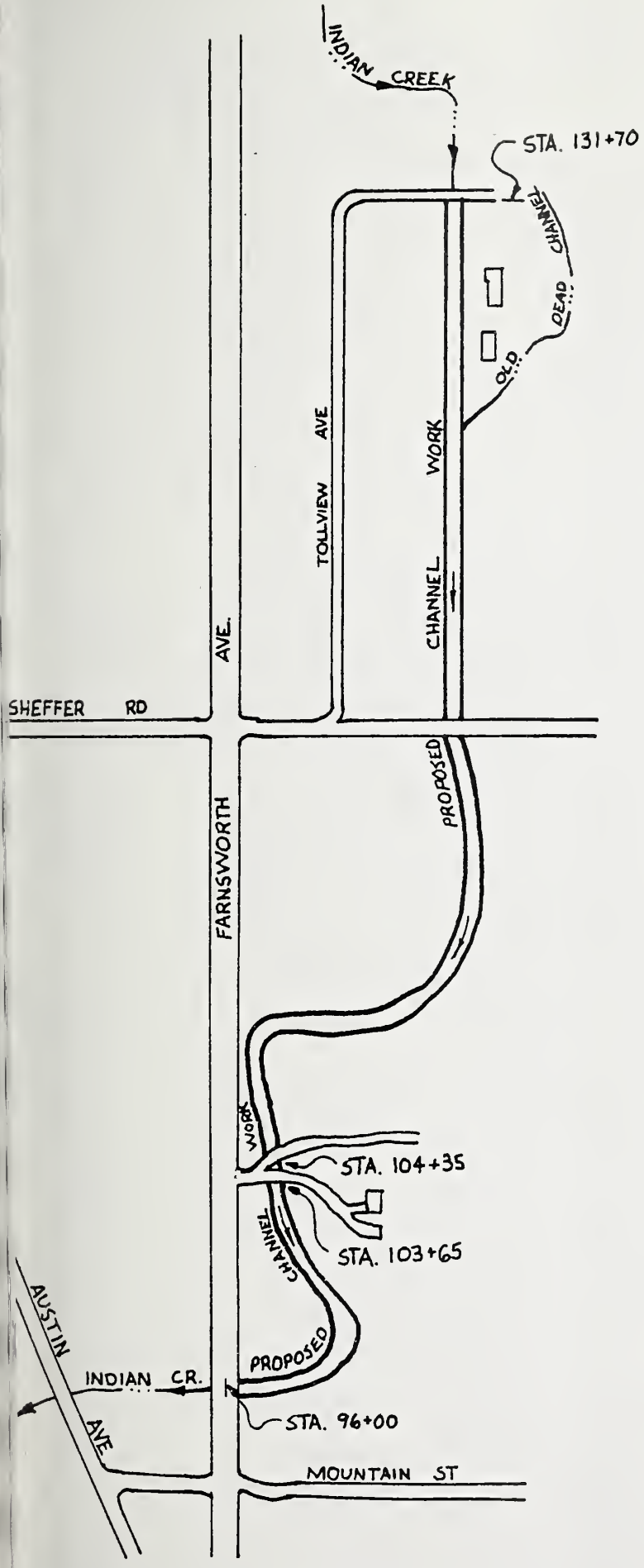
McCLURE RESERVOIR (C)
INDIAN CREEK & TRIBS. WATERSHED
KANE CO., ILLINOIS

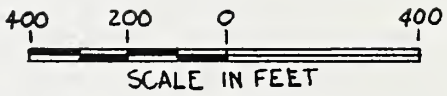


STATION	BOTTOM WIDTH(FT.)	DEPTH (FT)	SIDE SLOPES
FARNSWORTH	ADD I	8'x8'x60' R.C. BOX	CULVERT
176+80	24	8-10	3:1
187+15	30	5-8	3:1
201+55	30	5-8	3:1
MOLITOR RD	ADD I	7'x10'x60' R.C. BOX	CULVERT
202+15	20	6	2:1
207+90	20	6	2:1
215+00	18	6	2:1
223+00	18	6	2:1

APPENDIX C

UPPER CHANNEL INDIAN CREEK & TRIBS. WATERSHED KANE CO., ILLINOIS





STATION 96+00 TO 131+70

BOTTOM WIDTH	20 FEET
DEPTH	5-7 FEET
SIDE SLOPES	3:1

AT STATION 96+00

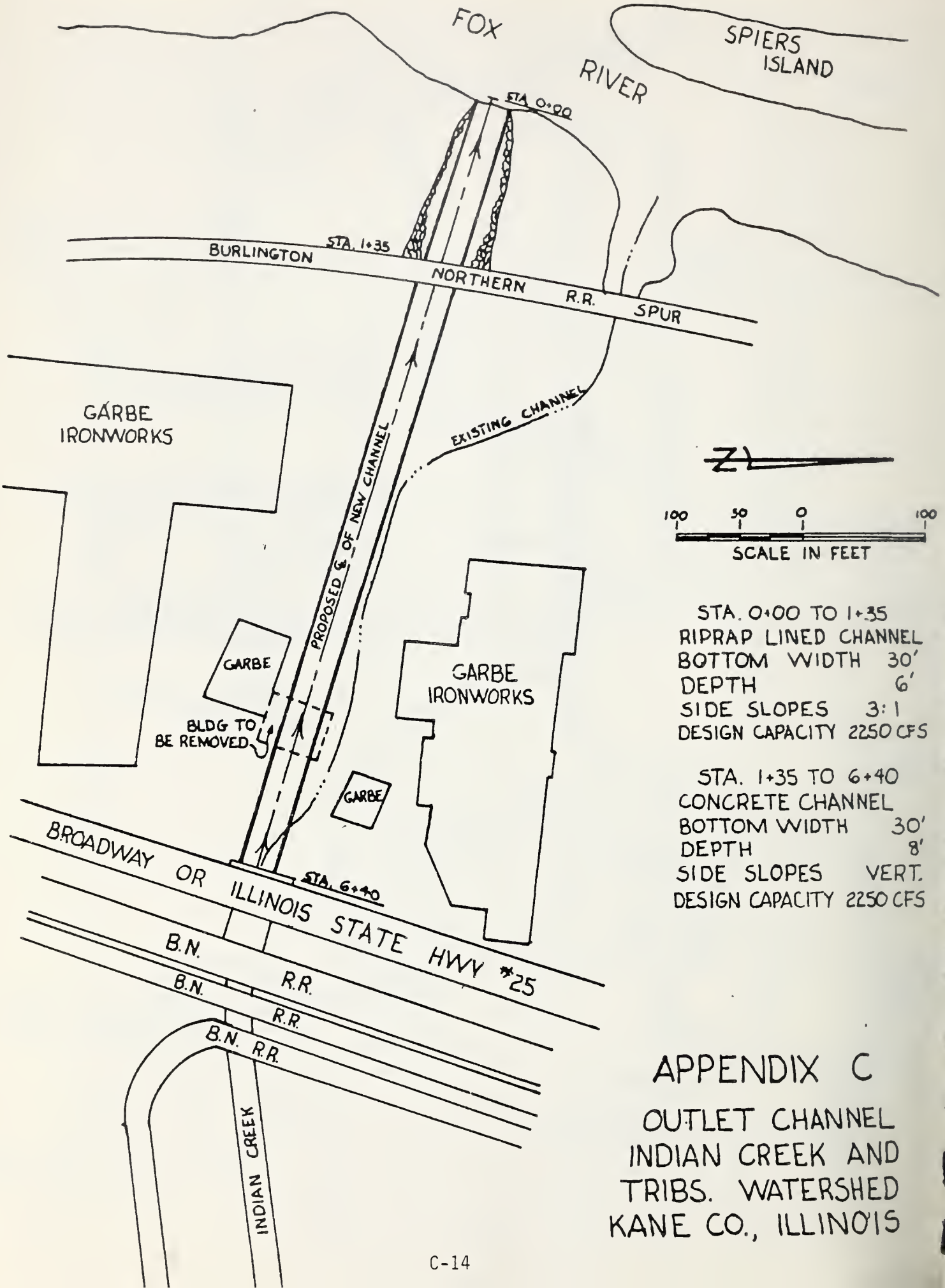
NEW 3-10'×10'×60' R.C. BOX CULVERT

AT STATION 103+65

NEW BRIDGE

APPENDIX C

MIDDLE CHANNEL INDIAN CREEK & TRIBS. WATERSHED KANE CO., ILLINOIS

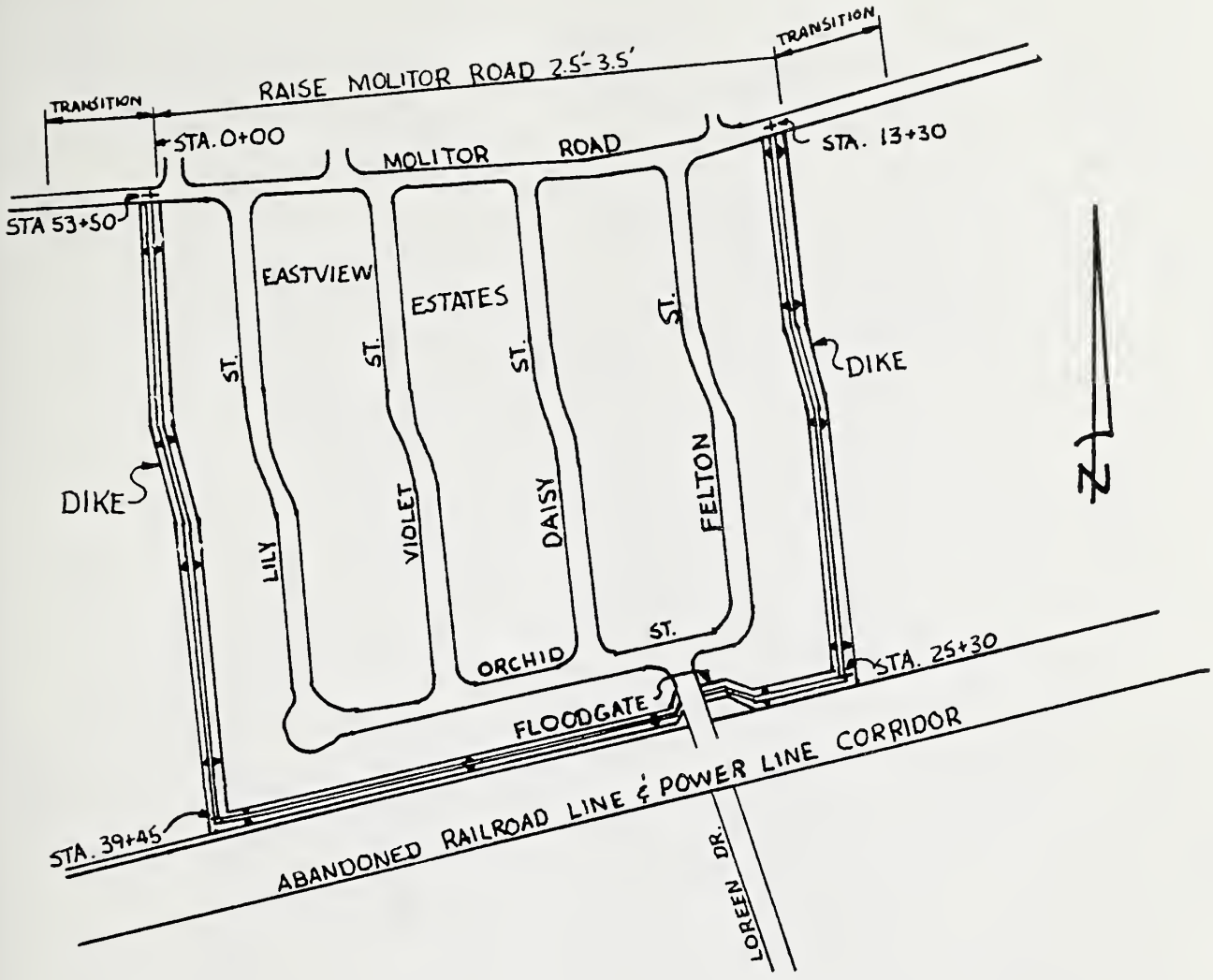


STA. 0+00 TO 1+35
RIPRAP LINED CHANNEL
BOTTOM WIDTH 30'
DEPTH 6'
SIDE SLOPES 3:1
DESIGN CAPACITY 2250 CFS

STA. 1+35 TO 6+40
CONCRETE CHANNEL
BOTTOM WIDTH 30'
DEPTH 8'
SIDE SLOPES VERT.
DESIGN CAPACITY 2250 CFS

APPENDIX C

OUTLET CHANNEL INDIAN CREEK AND TRIBS. WATERSHED KANE CO., ILLINOIS



RAISE MOLITOR ROAD	
TOP WIDTH	24 FEET
HEIGHT	2.5-3.5 FEET
LENGTH	1730 FEET
SIDE SLOPES	3:1

STATION 13+30 TO 53+50	
TOP WIDTH	10 FEET
HEIGHT	2-6 FEET
SIDE SLOPES	3:1

NOTE: INSTALL FLOODGATE BETWEEN FELTON ST. AND LOREEN DR.
: INSTALL PUMP STATION FOR LOCAL DRAINAGE INSIDE OF DIKE SYSTEM.

400 200 0 400
SCALE IN FEET

APPENDIX C

EASTVIEW DIKE INDIAN CREEK & TRIBS. WATERSHED KANE CO., ILLINOIS

APPENDIX D

INDIAN CREEK AND TRIBUTARIES

Floodplain Management Study
Structural Elements Evaluated

This Appendix gives the background information about all structural elements evaluated as part of this Floodplain Management Study. The following pages include comparison tables describing both physical and economic information on each structure. The cost estimate sheets identify the quantities and unit prices used to obtain the cost estimates used in the evaluation. A verbal description of each of these structures is included in the main body of the report. The unit prices were increased from the draft report to reflect the current costs experienced by DWR. The land rights prices reflect current zoning.

APPENDIX D
INDIAN CREEK & TRIBUTARIES
Floodplain Management Study
STRUCTURAL ELEMENTS EVALUATED
Physical Data

Structural Element	Flood Storage AcFt	Land Required (Ac)	Surface Area Flood Pool (Ac)	Surface Area Bottom (Ac)	Depth (Ft)	Side Slopes	Bypass Structure	Type of Inlet	Type of Outlet
Reservoirs									
#13	337	56	52	47	6.5	5:1	Constructed Chnl 225cfs	Concrete Chute	2 ea 48" RCP 1/
#14	104	19	15.1	12.2	5.0	5:1	None	Rock Chute	10' bottom 2/ 3:1 side slope Channel
#15	381	56	52	46	7.5	5:1	Constructed Chnl 225cfs	Concrete Chute	2 ea 48" RCP 3/
#16	225	80	48	45	4.0 Eff. Storage	4:1	None	Open Channel	Low Area 4/ along channel
#41	27	11	9.5	8.6	3.0	5:1	None	Waterway	1 ea 24" CMP 5/
#84	46	14	12.4	10.5	4.0	5:1	None	Rock Chute	1 ea 38"x60"CMP
#85	13	4.5	4.0	3.0	4.0	5:1	None	Wtrwy or Pipe	1 ea 48" CMP
#86	32	15	13.6	12.6	3.0	5:1	None	Rock Chute	1 ea 24" CMP 5/
#87	56	19	17.5	15.5	4.0	5:1	None	Wtrwy or Pipe	1 ea 38"x60"CMP
McClure									
125 cfs byps(A)	275	15	13.2	4.0	30	3:1	2 ea 36"RCP	Concrete Drop	Pumping Plant 6/
150 cfs byps(B)	250	15	13.2	7.4	25	3:1	1 ea 42"RCP 1 ea 36"RCP	Concrete Drop and Chute	Pumping Plant 6/
200 cfs byps(C)	200	13	10.7	5.9	25	3:1	1 ea 48"RCP 1 ea 42"RCP	Concrete Drop and Chute	Pumping Plant 6/

1/ Top of dike over pipes at 718.0 - overtops for 25 year storm and existing box culvert at the tollroad acts as control for 500 year storm.
2/ Existing box culvert at tollroad acts as control.
3/ Top of dike at 718.0 overtops for 100 year storm.
4/ Existing bridge on the Prairie Path acts as control.
5/ Need to deepen existing channel along RR to Felton Road.
6/ Construct 800 lin.ft of bypass channel.

APPENDIX D
INDIAN CREEK & TRIBUTARIES
Floodplain Management Study
STRUCTURAL ELEMENTS EVALUATED
Physical Data

Channels	Length (Feet)	Land Required (Acres)	Bottom Width (Feet)	Type of Protection	Depth (Feet)	Side Slopes	Other Information
	1,510		18	Grass	6	2:1	Rock Rip Rap on two curves.
Upper Indian	575	8	20	Grass	6	2:1	Addl. 7'x10' clvrt at Molitor Rd
	1,440		30	Grass	5-8	3:1	
	1,035		24	Grass	8-10	3:1	Addl. 8'x8' clvrt at Farnsworth
Middle Indian	3,570	6	20	Grass	5-7	3:1	Clean Sheffer bridge, remove 2 private bridges and replace with one bridge, replace existing culverts on Farnsworth with 3 ea 10'x10' culverts.
Outlet Indian	500	0.5	30	Concrete	8	Vertical	Install two new bridges 30' wide
	140		30	Rock Rip Rap	6	3:1	x 34' span
Eastview Dike	1,300	Molitor Road + 0.8 Acres	24	3:1	Rebuild Molitor Road 1.5' to 2.5' higher, install Floodgate at Felton Road.		
	4,040	4.5 Acres	10	3:1	Install pumping plant, put flap gate on existing storm sewer.		

APPENDIX D
INDIAN CREEK & TRIBUTARIES
Floodplain Management Study
STRUCTURAL ELEMENTS EVALUATED
Cost-Benefit Summary

Structural Element	INSTALLATION COSTS					Annual OM&R	Total Annual Costs	Estimated Benefits (As first Increment)	Benefit Cost Ratio
	Construction	Engineering and Project Adminstration	Land Rights	Other	Total				
Reservoir 13	1,480,800	296,200	840,000	---	2,617,000	4,700	230,500	70,000	0.30:1
Reservoir 14	464,400	92,900	250,000	---	807,300	1,200	70,800	20,000	0.28:1
Reservoir 15	1,808,100	361,600	840,000	---	3,009,700	5,500	265,100	80,000	0.30:1
Reservoir 16	1,837,000	367,400	80,000	---	2,284,400	5,100	202,200	70,000	0.35:1
Reservoir 41	151,300	30,300	55,000	---	236,600	400	20,800		
Reservoir 84	382,900	76,600	210,000	2,000	671,500	1,100	59,000	77,000 1/	1.96:1 1/
Reservoir 85	-----Not Determined - Part of Planned Subdivision ----								
Reservoir 86	234,700	46,900	75,000	---	356,600	700	31,500		
Reservoir 87	542,400	108,500	285,000	2,000	937,900	1,600	82,500	82,800 2/	0.73:1 2/
McClure Res.									
125 cfs byps	2,732,500	546,500	304,000	---	3,583,000	13,700	322,800	240,000	0.74:1
150 cfs byps	2,477,700	495,500	304,000	---	3,277,200	12,400	295,100	235,000	0.80:1
200 cfs byps	2,107,800	421,600	254,000	---	2,783,400	11,300	251,400	214,000	0.85:1
Upper Channel	397,500	79,500	85,000	---	562,000	1,400	49,900	79,500	1.59:1
Midl. Channel	340,900	68,100	58,000	---	467,000	1,000	41,300	5,430	0.13:1
Otlt. Channel	642,700	128,500	20,000	5,000	796,200	3,000	71,700	73,000	1.02:1
EastView Dike	314,800	63,000	106,000	622,000 3/	1,105,800	2,300	97,700	87,000	0.89:1

1/ Reservoir 41 and 84 are considered together for this increment.
2/ Reservoir 86 and 87 are considered together for this increment.
3/ Includes $620,000 for flood easement on 70 acres located east and south of dike.

WS12:11

APPENDIX D
INDIAN CREEK - AURORA WATERSHED
FLOODPLAIN MANAGEMENT STUDY
STRUCTURE 13
COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	332,100 cu yds	$3.00/ cu yd	$966,300
Earthfill	8,800 cu yds	2.00/ cu yd	17,600
Riprap	220 cu yds	80/ cu yd	17,600
Topsoil	7,700 sq yds	1.00/ cu yd	7,700
Concrete	230 cu yds	400/ cu yd	92,000
Steel	29,900 lbs	.60/ lb	17,940
Drop Spillway	1 job	lump sum	75,000
48" R.C.P.	100 L.F.	100/L.F.	10,000
Seeding	56 acres	2,000 acre	112,000
		Subtotal	$1,346,140
10% contingency			134,660
		Total	$1,480,800

Construction Cost	$1,480,800	
Engr Services & Proj Admin		
20% of const cost	296,200	
Land rights:		
56 acres @ $15,000/ac	840,000	
Total Installation Cost	= $2,617,000	
Average Annual Cost (.08627)	= $225,800	
O&M	= 4,700	
Total Annual Cost	= $230,500	

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 14

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	99,800 cu yds	$3.00/ cu yd	$299,400
Topsoil	73,100 sq yds	1.00/ sq yd	73,100
Seeding	15.5 acres	2000/ acre	31,000
Riprap	1 Job	Lump sum	18,700
		Subtotal	$422,200
10% contingency			42,200
		Total	$464,400

Construction Cost	$464,400
Engr Service & Proj Admin	
20% of cons cost	92,900
Land Rights:	
15.5 ac @ $15,000/ac	232,500
3.5 ac @ 5000 acres (oaks)	17,500
Total Installation Cost =	807,300

Average Annual Cost (.08627)	$69,600
O&M	1,200
	$70,800

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 15

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	431,300 cu yds	$3.00/cu yd	$1,293,900
Earth fill	8,800 cu yds	2.00/cu yd	17,600
Riprap	220 cu yds	80/ cu yd	17,600
Topsoil	7,700 sq yd	1.00/sq yd	7,700
Concrete	230 cu yds	400/cu yd	92,000
Steel	29,900 lbs	.60/lb	17,940
Drop Spillway	1 Job	Lump sum	75,000
48" R.C.P.	100 L.F.	100/L.F.	10,000
Seeding	56 acres	2000/ac	112,000
		Subtotal	$1,643,740
10% contingency			164,360
		Total	$1,808,100

Construction cost	$1,808,100
Engr Services & Proj Admin	
70% of const cost	361,600
Land Rights:	
56 acres @ $15,000/ac	840,000
Total Installation Cost	$3,009,700
Average Annual Cost (.08621)	$259,600
O&M	5,500
Total Annual Cost	$265,100

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 16

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	510,000 cu yds	$3.00/cu yd	$1,530,000
Brush & Small tree removal	10 acres	2,000/ac	20,000
Sediment & Erosion control, wldlife	50 acres	1200/ac	60,000
Seeding	10 acres	2000/ac	20,000
Wetland plantings	40 acres	1000/ac	40,000
		Subtotal	$1,670,000
10% contingency			167,000
		Total	$1,837,000

Construction Cost	$1,837,000	
Engr Services & Proj Admin		
20% of cons cost	367,400	
Land Rights:		
(50 ac for site & 30 ac wildlife preserve)		
80 acres @ $1000/ac	80,000	
Total Installation Cost	$2,284,400	
Average Annual Cost (.08627)	197,100	
O&M	5,100	
Total Annual Cost	$202,200	

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 41

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	37,000 cu yds	$3.00/cu yd	$111,000
24" R.C.P.	50 L.F.	$35/LF	1,750
Riprap	35 cu yd	$80/cu yd	2,800
Seeding	11 acres	$2000 ac	22,000
		Subtotal	$137,550
10% contingency			13,750
		Total	$151,300

Construction Cost	$151,300
Engrg Services & Proj Admin	
30% of const cost	30,300
Land Rights:	
11 acres @ $5000/ac	55,000
Total Installation Cost	$236,600
Average Annual (.08627)	20,400
O&M	400
Total Annual Cost	$20,800

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 84

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	92,000 cu yds	$3.00/cu yd	$276,000
38" x 60" CMP	350 L.F.	$126/L.F.	44,100
Seeding	14 acres	$2,000/ac	28,000
		Subtotal	$348,100
10% contingency			34,800
		Total	$382,900

Construction Cost	$382,900
Engr Services & Proj Admin	
20% of const cost	76,600
Other Costs:	
Remove 2 old buildngs	2,000
Land Rights:	
14 acres @ $15,000 ac	210,000
Total Installation Cost	$671,500
Average Annual Cost (.08627)	$57,900
O&M	1,100
Total Annual Cost	$59,000

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 86

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	59,600 cu yd	$3.00/cu yd	$178,800
24" RCP	50 LF	35/LF	1,750
Riprap	35 cu yd	80/cu yd	2,800
Seeding	15 acres	2000/ac	30,000
		Subtotal	$213,350
10% contingency			21,350
		Total	$234,700

Construction Cost	$234,700
Engr Services & Proj Admin	
20% of const cost	46,900
Land Rights:	
15 ac @ $5000/acre	75,000
Total Installation Cost	$356,600
Average Annual Cost (.08627)	$ 30,800
O&M	700
Total Annual Cost	$ 31,500

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

STRUCTURE 87

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	137,000 cu yd	$3.00/cu yd	$411,000
38" x 60" CMP	350 LF	$126/LF	44,100
Seeding	19 acres	2000/acre	38,000
		Subtotal	$493,100
10% contingency			49,300
		Total	542,400

Construction Cost	$542,400
Engr Services & Proj Admin	
20% of const cost	108,500
Other Costs:	
Remove 2 old buildings	2,000
Land Rights:	
19 acres @ $15000/ac	$285,000
Total Installation Cost	$937,900
Average Annual Cost (.08627)	$ 80,900
O&M	1,600
Total Annual Cost	$ 82,500

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

McCLURE RESERVOIR (125cfs bypass)(A)

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	461,225 cu yd	$3.00/cu yd	$1,383,675
Earthfill	1,900 cu yd	2.00/cu yd	3,800
Riprap	430 cu yd	80/cu yd	34,400
Topsoil	73,600 sq yd	1.00/sq yd	73,600
Seeding	15.2 acres	2000/ac	30,400
6" A-C dr pipe	330 LF	15/LF	4,950
Drainfill	600 cu yds	26/cu yd	15,600
Pumphouse	1 Job	Lump sum	598,000
Concrete	682.3 cu yd	400/cu yd	272,920
Steel	88,700 lbs	.60/lb	53,220
Trash Rack	1 Each	5000/each	5,000
42" RCP	50 LF	90/LF	4,500
36" RCP	50 LF	80/LF	4,000
		Subtotal	$2,484,065
10% contingency			248,435
		Total	$2,732,500

Construction Cost	$2,732,500
Engr Services & Proj Admin	
20% of cost	546,500
Land Rts:15.2 acres @ $20,000/ac	304,000
Total Installation Cost	$3,583,000
Average Annual Cost (.08627)	309,100
O&M	13,700
Total Annual Cost	$ 322,800

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

McCLURE RESERVOIR (150cfs bypass)(B)

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	420,900 cu yd	$3.00/cu yd	$1,262,700
Earthfill	1,900 cu yd	2.00/cu yd	3,800
Riprap	420 cu yd	80/cu yd	33,600
Topsoil	73,600 sq yd	1.00/sq yd	73,600
Seeding	15.2 acres	2000/ac	30,400
6" A-C dr pipe	330 LF	15/LF	4,950
Drainfill	600 cu yds	26/cu yd	15,600
Pumphouse	1 Job	Lump sum	513,200
Concrete	630 cu yd	400/cu yd	252,000
Steel	81,900 lbs	.60/lb	49,140
Trash Rack	1 Each	5000/each	5,000
42" RCP	50 LF	90/LF	4,500
36" RCP	50 LF	80/LF	4,000
		Subtotal	$2,252,490
10% of contingency			225,210
Construction Cost		$2,477,700	
Engr Services & Proj Admin			
20% of cost		495,500	
Land Rights:			
15.2 acres @ $20,000/ac		304,000	
Total Installation Cost		$3,277,200	
Average Annual Cost (.08627)		282,700	
O&M		12,400	
Total Annual Cost		295,100	

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

McCLURE RESERVOIR (200cfs bypass)(C)

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	342,300 cu yd	$3.00/cu yd	$1,026,900
Earthfill	1,900 cu yd	2.00/cu yd	3,800
Riprap	410 cu yd	80/cu yd	32,800
Topsoil	61,500 sq yd	1.00/sq yd	61,500
Seeding	12.7 acres	2000/ac	25,400
6" A-C dr pipe	300 LF	15/LF	4,500
Drainfill	530 cu yds	26/cu yd	13,780
Pumphouse	1 Job	Lump sum	494,000
Concrete	500 cu yd	400/cu yd	200,000
Steel	65,000 lbs	.60/lb	39,000
Trash Rack	1 Each	5000/each	5,000
48" RCP	50 LF	100/LF	5,000
42" RCP	50 LF	90/LF	4,500
		Subtotal	$1,916,180
10% contingency			191,620
		Total	$2,107,800

Construction Cost	$2,107,800
Engr Services & Proj Admin	
20% of cost	421,600
Land Rts:12.7 ac @ $20,000/ac	254,000
Total Installation Cost	$2,783,400
Average Annual Cost (.08627)	240,100
O&M	11,300
Total Annual Cost	$ 251,400

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

UPPER CHANNEL

COST ESTIMATE

Adding a 8' x 8' x 60' RC Box culvert at Farnsworth (sta. 176 + 40)

Item	Quantity	Unit Price	Total Price
Concrete	90 cu yds	$400/cu yd	$36,000
Steel	12000 lbs	.60/lb	7,200
Structure removal	1 Job	Lump sum	1,000
Structure excavation	560 cu yds	$6/cu yd	3,360
Structure backfill	300 cu yds	$6/cu yds	1,800
New roadway	100 LF	$65/LF	6,500
Traffic control	1 Job	Lump sum	12,000
		Subtotal	$67,860
10% contingency			6,740
		Total	$74,600

Construction cost	74,600
Engr Services & Proj Admin	
20% of constr cost	14,900
Installation total	89,500

Channel Work and Molitor Road Culvert Modification

Earthfill	240 cu yds	$5/cu yd	$1,200
Excavation	21,100 cu yds	$5.50/cu yd	116,050
Structure excavation	1200 cu yds	$10/cu yd	12,000
Riprap	620 cu yds	$80/cu yd	49,600

Concrete Removal	80 cu yds	175/cu yd	14,000
Concrete	150 cu yds	400/cu yd	60,000
Steel	19,500 lbs	.60/lb	11,700
New Roadway	30 LF	$65/LF	1,950
Traffic control	1 Job	Lump sum	10,000
Seeding	8.5 acres	$2000/ac	17,000
		Subtotal	293,500
10% contingency			29,400
		Total	$322,900

Construction cost	$322,900
Engr Services & Proj Admin	
20% of constr cost	$ 64,600
Land Rights:	
8.5 acres @ $10,000/ac	$ 85,000
Installation Cost	472,500

Summary

Total Construction Cost	$397,500
Total Engr Serv & Proj Admin	79,500
Total land rights	85,000
Total Installtion Cost	$562,000
Average Annual Cost (.08627)	$48,500
O&M	1,400
Total Annual Cost	$49,900

APPENDIX D

INDIAN CREEK - AURORA WATERSHED

FLOODPLAIN MANAGEMENT STUDY

MIDDLE CHANNEL

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	8600 cu yd	$5.50/cu yd	$47,300
Riprap	160 cu yds	80/cu yd	12,800
Seeding	5.8 acres	2000/ac	11,600
New conduits at Farnsworth (sta 96 + 00)		see page 2	171,000
New bridge at sta 103 + 65 (see page 2)			67,200
		Subtotal	309,900
10% contingency			31,000
Construction Total			$340,900
Engr services & Proj Admin: 20% of const cost			68,100
Land rights: 5.8 acres @ $10,000/acre			58,000
Total Installation cost			467,000
Average Annual Cost (.08627)			40,300
O&M			1,000
Total Annual Cost			41,300

New conduits at Farnsworth Av (sta 96 + 00)

Three 10' x 10' x 60' RC box culverts with wingwalls

Item	Quantity	Unit Price	Total Price
Concrete	260 cu yds	$400/cu yd	$104,000
Steel	34,000lbs	.60/lb	20,400
Structure removal	3 each	$1000/each	3,000
Structure excavation	1600 cu yds	$6/cu yd	9,600
Structure backfill	1000 cu yds	$6/cu yd	6,000
New roadway	200 LF	$65/LF	13,000
Traffic control	1 Job	Lump sum	15,000
		Subtotal	$171,000

New bridge at sta 103 + 65

Assume 28' x 40' size = 1120 sq ft

Assume $60/sq ft x 1120 sq ft = $67,200

APPENDIX D

INDIAN CREEK AND TRIBUTARIES

FLOODPLAIN MANAGEMENT STUDY

OUTLET CHANNEL

COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation	7100 cu yds	$5.50/cu yds	$39,050
Earthfill	3400 cu yds	$4/cu yds	13,600
Concrete	750 cu yds	$400/cu yd	300,000
Steel	97,500 lbs	.60/lb	58,500
Riprap	370 cu yds	80/cu yd	29,600
Drainfill	220 cu yds	26/cu yd	5,720
Sediment & Erosion con	640 LF	15/LF	9,600
Guardrails	1000 LF	17/LF	17,000
		Subtotal	473,070
10% contingency			47,230
		Subtotal	520,300
Two new bridges (30' x 34') 2040 sq ft		$60/sq ft	$122,400
	Construction Cost Total		642,700
Engr services & Proj Admin cost			
20% of construction cost			128,500
Other costs:			
Relocations (building & overhead crane)			5,000
Land Rights: 0.5 ac @ $40,000/ac			20,000
Total Installation Cost			796,200
Average Annual Cost (.08627)			68,700
O&M			3,000
Total Annual Cost			$71,700

APPENDIX D
INDIAN CREEK AND TRIBUTARIES
FLOODPLAIN MANAGEMENT STUDY
EASTVIEW DIKE
COST ESTIMATE

Item	Quantity	Unit Price	Total Price
Excavation, common	3600 cu yds	$3.00/cu yds	$ 10,800
Excavation (old roadway)	2700 cu yds	$10/cu yd	27,000
Earthfill	24,200 cu yds	$3/cu yd	72,600
Topsoil	12,220 sq yds	1.00/cu yd	12,220
New roadway 24' wide	1730 LF	65/LF	112,450
Driveways roadway	13 each	700/each	9,100
Floodgate: 40'w x 3.5'h	1 each	Lump sum	14,000
Pump station	1 Job	Lump sum	18,000
Traffic control	1 Job	Lump sum	10,000
		Subtotal	$286,170
10% contingency			28,630
	Construction Cost		$314,800
Engr services & Proj Admin 20% of const cost			63,000
Other costs:			
Relocate 2 buildings/$1000 ea			2,000
Flood easement on 70 acres			620,000
Land rights:			
Roadway: 10' each side,			
20' x 1730'/43,560		0.8 ac	
Dike: 49' x 3956/43,560		4.5 ac	
Total		5.3 ac	
5.3 ac x $20,000/ac			$106,000
Total Installation Cost			$1,105,800
Average Annual Cost (.08627)		$95,400	
O&M		2,300	
Total Annual Cost		$97,700	

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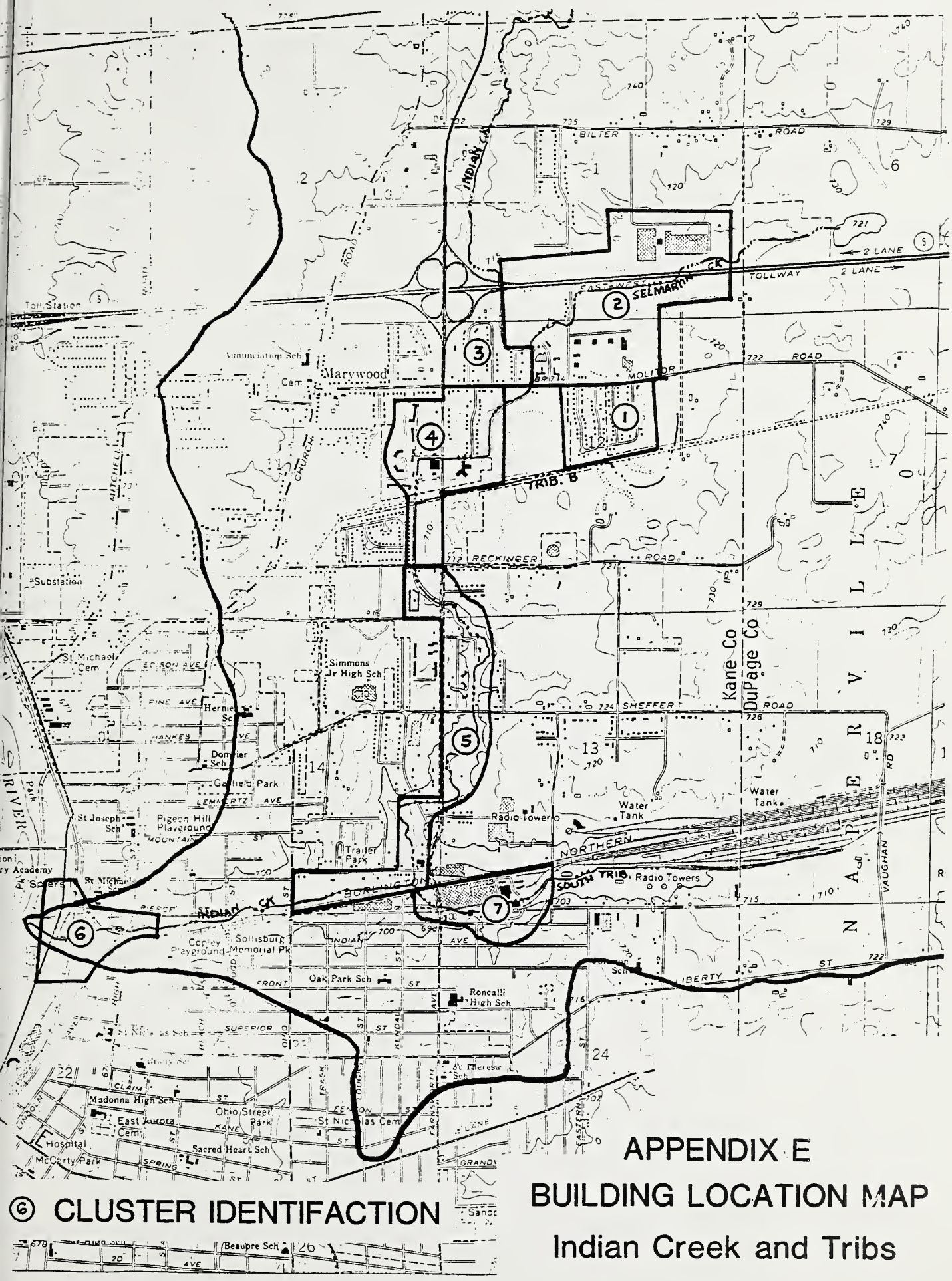

APPENDIX E
BUILDING LOCATION MAP
Indian Creek and Tribs

⑥ CLUSTER IDENTIFACTION

APPENDIX F
INDIAN CREEK FLOODPLAIN MANAGEMENT STUDY
BUILDING AND FLOOD WATER ELEVATIONS

BUILDING IDENTIFICATION		BUILDING ELEVATION		PRESENT CONDITIONS			FUTURE/WITH 2 INCHES		
Eval. Number	Street Address (Description)	First Floor	Low Water Entry	10% Chance	1% Chance	0.2% Chance	10% Chance	1% Chance	0.2% Chance
CLUSTER 1									
1-1	[illegible] Molitor Road	715.7	715.3	714.8	715.2	715.5	714.8	715.2	715.5
1-2	) Lily	717.0	715.6	"	"	"	"	"	"
1-3	) "	717.0	715.8	"	"	"	"	"	"
1-4	) "	716.7	715.5	"	"	"	"	"	"
1-5	) "	716.6	715.2	"	"	"	"	"	"
1-6	) "	716.2	714.7	714.8	715.2	715.5	714.8	715.2	715.5
1-7	) "	715.9	714.4	"	"	"	"	"	"
1-8	) "	716.0	714.5	"	"	"	"	"	"
1-9	) "	715.5	713.8	"	"	"	"	"	"
1-10	) "	715.8	714.7	"	"	"	"	"	"
1-11	) "	715.0	714.7	714.8	715.2	715.5	714.8	715.2	715.5
1-12	) "	716.0	714.5	"	"	"	"	"	"
1-13	) "	717.0	716.2	"	"	"	"	"	"
1-14	) "	716.0	715.3	"	"	"	"	"	"
1-14/	) "	717.7	717.2	"	"	"	"	"	"
1-15	) "	718.0	716.7	714.8	715.2	715.5	714.8	715.2	715.5
1-16	5 Orchrid	717.7	716	"	"	"	"	"	"
1-16/	5 " (Garage)	717.7	717	"	"	"	"	"	"
1-17	5 "	717.7	716.3	"	"	"	"	"	"
1-18	5 "	718.1	716	"	"	"	"	"	"
1-18	5 "	71	716	714.8	715.2	715.5	714.8	715.2	715.5
1-19	5 "	717	716.0	"	"	"	"	"	"
1-20	5 "	715	716.0	"	"	"	"	"	"
1-21	5 "	714.8	714.9	"	"	"	"	"	"
1-22	1 "	716.2	716.3	"	"	"	"	"	"

APPENDIX G
INVESTIGATIONS AND ANALYSIS

Surveys and Mapping

All surveys were performed by the State of Illinois, Department of Transportation, Division of Water Resources (DWR) as part of its contribution as co-sponsors of this study. Detailed surveys included valley cross sections and centerline of roads along with bridge and culvert dimensions for use in analyzing hydraulic characteristics. They also obtained first floor and low water entry elevations for 348 residences, businesses and related structures for use in flood damage analysis.

Detailed topographic maps prepared by DWR in 1976 with 1 inch = 200 feet scale and 2 foot contour interval were used for the initial evaluation of the floodprone areas. During detailed surveys it was noted that 2 or 3 of the sheets did not accurately describe the floodprone area. In addition, the 1976 maps did not include all areas discussed by the steering committee as having a flood problem. In 1984, the City of Aurora decided to obtain orthophotographic background topographic maps for all land in their domain. The maps for the Indian Creek floodplain areas were provided to the SCS in December 1984. These maps were prepared at a scale of one inch = 100 feet with one foot contour intervals. The maps have been reduced to 1/2 size ie: 1" = 200 feet for use in this report.

The City of Aurora maps were used as base maps for alternative evaluation, economic evaluation, expanded basic data, and preparation of floodplain and floodway maps included in this report.

Hydrology

Hydrologic modeling for this study was completed through the use of the SCS Computer Program for Project Formulation (Technical Release 20, Reference 8). This program is an advanced hydrologic model which simulates flood stages and discharges. The stages and discharges are related to watershed characteristics such as drainage area, hydrologic soil group, land use and cover, time of concentration, and channel and floodplain hydraulic characteristics. Given these characteristics and rainfall amounts, the model will develop hydrographs for local drainage areas and perform a specified series of channel and reservoir routings as well as hydrograph additions. The result is peak discharges, hydrograph shape, and runoff volumes at specified locations throughout the watershed.

The present condition model for this study was based on 1984 land use in the watershed area and was checked for reasonableness against the historic floods of 1982 and 1983. The model evaluated two different rainfall distributions; the SCS type 2 and the Illinois State Water Survey storm distribution for Northeast Illinois. The final evaluation is based on the SCS type 2 distribution with twenty-four hour rainfall values as presented in Technical Paper 40, US Department of Commerce - Weather Bureau, May 1961.

The future condition model, for the year 2005, was developed by modifying runoff curve numbers and times of concentration to reflect increased urban development. Based on input from local governments and the steering committee the future condition model also incorporates the installation of on-site

detention basins on all new development which store 2 inches of runoff from the development and releases the water at a rate of 0.15 cfs per acre of land draining into the basin. Once the inflow exceeds the storage capacity of the basin the outflow was estimated to be 1 to 2 cfs/acre for the first foot above the capacity of the basin. Beyond that elevation a large cfs/acre was used to indicate no storage effect on these flows.

The areas that were included as developed in 2005 were based on existing zoning maps of Kane County and the City of Aurora along with input from the steering committee on the areas likely to develop. Many of the areas are already platted and the developers are waiting for funding and housing needs to increase in this area.

The future condition model assumes that all existing natural storage is being maintained in the watershed. Some of the important areas are as follows: Upstream of the Prairie path on Fermi Lab, upstream of East-West Tollway on both Indian Creek and Selmarten Creek, the large swamp near Eola Road and the existing depression west of Vaughn Road and south of the railroad tracks in Section 18 and 19. According to the City of Aurora, they require compensatory storage on new development beyond the on-site detention requirement. The model predicted that when a significant percentage (60 to 90) of a subarea is new development that the 100 year peak discharge will be reduced by 10 to 30 percent and the 2 year peak discharge would be reduced as much as 60 percent.

Where only a limited amount of land was developed with on-site detention, the TR-20 model showed mixed results. Sometimes the peak flows were slightly lower and other times they increased slightly. It primarily depended on the location of the subarea in the watershed and the timing of its outflow with other contributing areas.

The flood discharges were certified in accordance with the state Floodplain Study Review Procedure. The review was conducted by the Illinios State Water Survey with certification by the Illinois Division of Water Resources.

Hydraulics

An analysis of the hydraulic characteristics of the creek was carried out to provide stage estimates for floods of selected recurrence intervals. The water surface elevations (stage) were established utilizing the physical characteristics of the channel including channel size and shape, floodplain size and shape, bridge sizes and shapes, and estimates of Manning's roughness coefficients. The hydraulic computations were made using the SCS Hydraulic Model WSP-2 (Technical Release 61, Reference 9). This model employed the standard step method for backwater profiles which is a computational procedure that estimates total energy at each stream cross section accounting for friction losses between sections. The bridge effects on stream hydraulics were accounted for using the Bureau of Public Roads Method. The bridge method, which is included in WSP-2, was formulated using the principle of

conservation of energy. The model employs this principle between the point of maximum backwater upstream from the bridge and a point downstream from the bridge at which normal stage has been established. Culverts were also evaluated using the principle of conservation of energy and depth of headwater and tailwater, the barrel shape and dimensions, type of intlet, and shape of headwall.

The hydraulic model requires the input of peak discharges in addition to the physical characteristics listed above. The peaks were taken from the hydrologic model at appropriate locations. Starting configuration was based on estimated water surface elevations of the Fox River. These range from 630.0 for the two year storm to 633.0 for the 500 year storm. Manning's roughness coefficients were estimated on the basis of field observations using the SCS procedures (Reference 11). All elevations are National Geodetic Vertical Datum.

The floodway was determined for the studied reach on Indian Creek, Selmarten Creek, South Tributary and Tributary B. It was computed on the basis of equal conveyance reduction from each side of the floodplain using the SCS Floodway Computer Program (Technical Release 64, Reference 10).

The Eastview Estates area was modeled as a reservoir to reflect the fact that once water enters the subdivision it ponds until it reaches a depth in excess of 3 feet. The predicted water surface profile on Indian Creek downstream of Molitor Road was compared to the calculated reservoir elevation. For all frequencies, the water surface in Eastview Estates was higher than Indian Creek predicted elevation. This matches historic data.

Flood Damage Analysis

The economic data for floodwater damages for this study was gathered by personal interviews with floodplain residents during the spring and summer of 1984. Data regarding damages to personal property, business property, loss of income, and the effects of flooding to safety and health was gathered. The final economic evaluation of personal property losses from floodwater was done by use of the Urban Floodwater Damage Economic Evaluation program (URB 1), Reference 15).

Properties within the floodplain were classified by major type that included basement structures, slab on grade, bi-level, tri-level, apartment, commercial and industrial. Engineering surveys were conducted to determine low water entry point, basement elevation and first floor elevations for each property. Coefficient damage curves published by the Federal Insurance Administration (FIA) and from the other urban studies were used in the URB 1 program to compute damages for each property. Occasionally these were adjusted to correlate with interview data. The coefficient damage curves represent percent damage factors by flood depth for buildings and contents of respective houses or other types of buildings. The URB 1 program locates each property based upon surveyed location and computes damages based upon frequency and depth of flooding related to the damage factors for that respective property.

The program lists the properties damaged for each alternative, and includes the following items for each property.

a) damage to property (building) by each storm
b) damage to contents by each storm
c) sum of property (building) and contents damage by each storm
d) sequence number listing of buildings
e) frequency of each damaging storm in flood series
f) total (building and contents) average annual damage for the property
g) flood elevation for each damaging storm
h) depth of flood in relation to first floor of building
i) frequency damages begin
j) computation of average annual damages for property and contents

Example of URB 1 output.

```
.....
** C          698.3     63000.0       696.6     65000.0     32500.0       696.7          7-28 **
.....
   PROPTY    CONTENTS   PROPTY      SEQ                  UPSTR   TOTAL                      DEPTH  FREQ      COMPUTATION FOR
   DAMAGE    DAMAGE     PLUS        HOUSE    STORM       XSECTN  AVG ANN     FLOOD          TO 1ST DAMAGE    AVG  ANN  DAMAGE
                        CONTENT     NUMBER   FREQ        STATION DAMAGE      ELEVATION      FLOOR  BEGINS    PROPERTY  CONTENT
-----------------------------------------------------------------------------------------------------------------------------
  6526.32   3011.96    9538.28     374      0.2         64645                  697.53         -0.8   4.40      13.25     6.02
  3767.02   1712.26    5479.29     374      1.0         64645                  697.13         -1.2              41.57     18.90
  1421.67    727.12    2350.79     374      2.0         64645                  696.83         -1.5              26.94     12.25
   905.57    411.80    1317.77     374      4.0         64645                  696.73         -1.6              25.28     11.49
                                                                  158.36                                       1.83      0.83
                                                                                                    TOTAL     108.87     49.49
```

Interviews with floodplain residents indicated flooding of Farnsworth and Broadway Avenues. The Illinois Department of Transportation provided a summary of daily traffic counts for those areas. Damages as a result of traffic detouring were computed at the rate of $.11/mile. Damage reduction benefits for each of the alternatives that had an effect upon the problem was based on the reduction in frequency of flood occurrence.

The effects of floodwater damages were evaluated for present conditions, future without project, and several structural alternatives.

All damage estimates were based upon current values (1984 price base). Damages from increased values of floodplain property due to expansion of existing facilities or the construction of new units were not evaluated.

Alternatives

This study was initiated following the floods of 1982 and 1983. The local people contacted the Illinois Division of Water Resources requesting that something be initiated to solve the problem. The information provided by the local people indicated the fact that the flooding in the area of Molitor Road was increasing as new development occured. Both floods did significant damages to residences in Eastview Estates.

The steering committee that was formed to provide guidance for this study included representatives from the local sponsoring organizations as well as representatives of interested organizations such as the IDOT, Division of Highways, homeowners associations, City of Aurora, Kane County and the Aurora Park District. Also in attendance at several of the steering committee meetings were the Illinois State Senator and State Representative for this district. The following list identifies the official representatives of the Steering Committee.

Indian Creek
Floodplain Management Study
Steering Committee

Title	Organization	Name
Chairman	DuPage Cty Planning Commission	Richard Young
Secretary	Soil Conservation Service	Tom Ryterske
Member	City of Aurora, Director of Public Works	Jim Nanninga
Member	Aurora Sanitary District	Paul Schuch
Member	Northeast Neighbors	Sondra Schepp
Member	Northeast Neighbors	Fred Runge
Member	Kane-DuPage SWCD	James Michels
Member	Kane-DuPage SWCD	Jack Young

All of the alternatives were evaluated using a 100 year project life and a discount rate of 8 5/8 percent.

One public meeting was held at the conclusion of the study to provide information on definition and quantification of the problem, alternatives evaluated, and future actions toward implementation. The meeting was well publicized through newspapers and hand delivered flyers and subsequently well attended. More than 50 local residents attended this meeting.

The following table summarizes the combination of structural measures other than those described in alternatives C and D that were presented to the steering committee at some time in the planning process.

WS:12:7

INDIAN CREEK FLOODPLAIN MANAGEMENT STUDY
SUMMARY AND COMPARISON OF OTHER ALTERNATIVES EVALUATED 1/
APPENDIX G

Alternatives	Total Project Installation	Annual Cost 2/	Annual Benefits	Net Annual Benefit	Benefit/Cost Ratio	Remaining Damages 3/	Number of Buildings Flooded 100 Yr 4/	Notes:
#1 Resv. 16, 41, 64, 65, & McClure (150 cfs)	6,783.5	604.5	398.0	-206.5	0.66:1	130.1	113	5/
#2 Resv. 16, 41, 84 & McClure (200 cfs)	5,975.9	533.4	361.0	-172.4	0.68:1	167.1	119	5/
#3 Resv. 16, 41, 84 McClure (200 cfs) & Outlet Channel	6,772.1	605.1	428.0	-177.1	0.71:1	100.1	110	5/
#4 Resv. 13, 14, 41, 84 McClure (200 cfs) & Outlet Channel	7,912.0	704.2	448.0	-256.2	0.63:1	80.1	80	5/
#5 Upper Channel, Middle Channel & Outlet Channel	1,825.2	162.9	161.8	-1.1	0.98:1	366.3	100	5/ 6/ 7/
#6 Upper Channel, Outlet Channel, Resv. 13, 86, 87 & McClure (200 cfs)	8,053.1	717.5	465.7	-251.8	0.65:1	62.4	40	5/
#7 Resv. 86, 87, Upper Channel & Outlet Channel	2,652.7	235.6	239.2	+3.6	1.01:1	288.9	61	6/
#8 Upper Channel, Outlet Channel, Resv. 15, 86, 87 & McClure (125 cfs)	9,245.4	823.5	504.2	-319.3	0.61:1	23.9	26	5/
#9 Upper Channel, Outlet Channel, Resv. 41, 84, & McClure (150 cfs)	5,543.5	496.5	468.4	-28.1	0.94:1	59.7	72	5/ 6/

1/ All costs, damages and benefits shown in $1,000.
2/ 100 Year period with interest rate of 8 5/8%.
3/ Future without project damages = $525,900 plus traffic damages of $2,250.
4/ 156 buildings flooded under future w/o project conditions.
5/ Not economically feasible.
6/ Increases damages to 10+ properties because of increased discharges.
7/ Does not provide protection to Eastview Estates area.

WS12:11